

T H E S C R I P T O F
H A R A P P A A N D M O H E N J O D A R O
A N D I T S C O N N E C T I O N
W I T H O T H E R S C R I P T S

BY

G. R. H U N T E R

With an Introduction by

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T H E T E X T S O F

H A R A P P A A N D M O H E N J O D A R O .

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A U T H O R ' S P R E F A C E .

This work was submitted in manuscript to the University of Oxford in June 1929, when I was supplicating for the degree of Doctor of Philosophy. Subsequently the manuscript has reposed in the Bodleian Library. Permission to publish it was received from the Government of India, Archaeological Dept., in November 1932.

It is my pleasant duty here to acknowledge my obligation to the Archaeological Department of the Government of India for permission to copy the inscriptions which form the subject matter of this volume. Since this volume was written I have by their courtesy been enabled to copy all the inscriptions subsequently recovered from Mohenjodaro and Harappa up to April 1931. On this material I am still working. But it is important that I should here state that the study of this new material tends only to fortify most of the conclusions reached in the volume now offered to the public.

I take this opportunity of expressing my gratitude to Professor Langdon, who most kindly placed at my disposal his own researches on the subject, and to my wife, who did most of the monotonous copying and re-copying involved in the production of the Tables, and whose pen is responsible for all the actual draughting in this volume.

I N T R O D U C T I O N.

Dr. Foster has continued his investigations on the early Easter Valley Script, which he began at Oxford, by copying many more seal inscriptions, which were excavated by Mr. Hurley at Roheniaia. Since the material, placed at the disposal of Mr. Sidney Smith, Mr. Sudd and myself, was available. In Monuments of the Indian Civilization, three large folio volumes edited by Sir John Marshall, Stambetham London, 1931, the script was investigated by the writers named above. Vol. II, chapter XXII, Monuments of Early Indian Script, by G. J. Sudd; Mechanical Nature of the Early Indian Writing, by Sidney Smith; chapter XXIII, The Indian Script by the writer. Dr. Foster has made an intensive study of greater material and has arrived at many valuable results of classification. Since Sir John Marshall's book was published, M. G. de Hevery has called attention to the script of the Easter Island, Bulletin de la Société Archéologique Française, 1933, Nos. 7-8, Sur Une Écriture Océanienne. There can be no doubt concerning the identity of the Indian and Easter Island scripts. Whether we are thus confronted by an astonishing historical accident or whether this ancient Indian script has mysteriously travelled to the remote islands of the Pacific none can say. The age of the Easter Island tablets made of wood is totally unknown, and

all knowledge of their writing has been lost. This same script has been found on seals precisely similar to the Indian seals in various parts of ancient Sumer, at Susa and the border land east of the Tigris.

As to progress in the interpretation the way is completely barred by the lack of any conceivable clue for even a guess at a means of interpretation. Here is a civilisation of whose history nothing has survived. It is impossible to suggest even the name of an historical person or place of that time in India. No group of signs can be suggested as having any definite pronunciation and identified with any name which can be suggested. The only possible clue which suggests itself to me is that the Sumerians must have known this script in their intercourse with travellers from India who brought the Indian seals to Sumer. Fragments of lists of archaic signs have been preserved; on these tablets the Sumerians identify these archaic signs with signs of the classical Sumerian and Babylonian script. Naturally most of the archaic signs preserved and explained on these tablets are peculiar forms of old Sumerian signs, which can be fitted into their place in the history of Cuneiform epigraphy. But a few appear to me to belong definitely to the prehistoric Indus Valley script. I refer to two tablets both in the British Museum, 81-7-27, 49+ 50, published in Cuneiform Texts, Vol. V, Pl. 7 and three fragments all apparently from the same tablet,

said to have been excavated in the S.E. Palace at Nimroud, N. 2527 published by Houghton in Transactions of the Society of Biblical Archaeology, VI 454. All these tablets come from Assyria, but the script used in the explanations of the archaic signs is that used in Babylonia circa 2000 B.C., a date not too far below the period in which Indus Valley seals are found at Mohenjo-daro, circa 2700 B.C. It is, therefore, entirely possible that the Babylonian epigraphists knew the Indus script. Now the scribe arranges the signs in order of the well known Sumerian Syllabary A and in CT.V7 Obv. 1 there is an extraordinary sign entered as the archaic form of NU, usual meaning negative "not", Sumerian value nu. This is totally unlike any archaic form of NU and may be the Indus sign 75 or 76 of my sign list. Naturally, if this thesis be true, all the scribe means to say is that the Indian sign means "not"; the phonetic value nu cannot be inferred unless the Indian language is Sumerian. Ibid. Rev. 11 2 there are extraordinary forms of the sign ĜAG "heart", restored by syllabary AII 52. One of these is identical with No. 87 of my list and two of them seem to be mere variants. If so, then the common Indian sign No. 87 means "heart", pronounced ġa, ġag in Sumerian. I do not mean to say that there is any certainty about this suggestion of the survival of Indian signs in the epigraphical texts of these Babylonian scribes. Sumerian texts of this kind or bilingual Sumerian and Indian inscriptions seem to offer the only possible help to which scholars may have recourse at present; for the Sumerians were the only literary people who knew this

only possible help to which scholars may have recourse at present: for the Sumerians were the only literary people who knew this writing and language when it was still written and spoken.

Dr. Hunter has presented here all the known material. His knowledge of all the existing variants of the signs is unsurpassed and I am glad to have the opportunity of commending his book to scholars as a trustworthy edition of the texts.

S. Langdon, Oxford, October 10, 1933.

The Script of Mohenjodaro and Harappa and its
relation to other scripts.

Abstract

The material for the above work was provided by some 750 inscribed objects unearthed at the above-mentioned sites up to February 1927. These objects were mostly seals, containing on average about 6 signs apiece. A few copper coins were also found, and some slabs of clay impressed. There were also at Harappa several incised slabs of steatite which appear to have served as receipts.

The signs are clearly of ideographic origin, some readily recognisable pictures, e.g. of birds, but most are conventionalised, in many cases beyond recognition of their pictorial originals. Graphically the script bears a close resemblance to Proto-Elamite, and a less close to Sumerian of the Ur III and Akkadian periods, except as regards the anthropomorphic signs. The latter bear a close resemblance to those of the Old and Middle Kingdoms. The resemblance to these three scripts seems too close to be accidental, but whether the connection is due to community of descent or borrowing has not yet been determined.

much evidence to show that these also were derived from the script of Harappa and Mohenjodaro (which I have called Proto-Indian). It is thus seen that Proto-Indian forms, an important link in the history of the evolution of the alphabet from pictographic writing. The method adopted in elucidating the script has been to tabulate every occurrence of each sign together with those signs whose morphography suggested the possibility of their being variants. In this way certain sign sequences showed themselves to be of common occurrence. Thus it was possible to recognise variants and also words.

The languages of Harappa and Mohenjodaro are shown to have been one and the same. It has not been possible to determine from the material at hand the identity of this language. It appears however to be monosyllabic. It does not appear to be the language of the Proto-Elamite tablets. It is possible on the latter to recognise those sign groups which constitute proper names. Similarly on the Proto-Indian seals the bulk of the legend is always a proper name. Many signs are common to both scripts, but the sequences are quite different. If then there are no proper names in common it is not likely that the languages are closely related.

Many of the signs of the Cypriote syllabary bear a close resemblance to Proto-Indian signs, but the phonetic values of the latter, as far as these can be determined from Brahmi and the Semitic scripts, are irreconcilable with the Cypriote phonetic values. If connection there be it must have been at a period before Proto-Indian became a phonetic script.

The script reads normally from right to left, but occasionally from left to right, and sometimes boustrophedon. In the latter case the signs are sometimes reversed, but not always. It is certain that the reversal of a sign had no

effect on its significance. The reading is over the backs of the animal signs, as in meroitic, but the anthropomorphous signs face the direction of the writing.

It has been possible to determine the significance of a few of the signs from the regularity of their occurrence in particular positions and contexts: In particular (a) the numeral signs, (b) the ordinal suffix, (c) the word for 'servant' and its determinative, (d) the ablative suffix, (e) the dative suffix, (f) the word for 'slave' and its determinative, (g) the word for 'son'. The coins bear the same names as the seals, votive tablets, and receipts, but of course without the dedicatory preface often found on the seals and votive tablets, and without the ablative suffix common on the receipts and not uncommon on the seals and votive tablets.

The work is divided as follows: (1) Introduction, (2) Descriptive catalogue, (3) Museum catalogue, (4) The direction of the writing, (5) Connection with other scripts, (6) Analysis of the Tables of Signs, (7) The Tables of Signs with a sign list, (8) A Comparative Table of Proto-Indian and allied signs, (9) An Appendix giving an analysis of Sumerian ideograms, with a view to elucidating their pictographic significance for the purpose of comparison with Proto-Indian.

THE SCRIPT OF
HARAPPA AND MOHENJODARO.

And its connection with other scripts.

LIST OF ABBREVIATIONS.

A.S.I.A.R.	Archaeological survey of India, Annual Reports.
C.A.R.	Gunningham, Archaeological survey of India, Reports.
C.H.I.	Cambridge History of India.
D.C.C.O.	Delaporte, Musée du Louvre, Catalogue des cylindres Orientaux.
Del. en Perse.	Délégation en Perse, Mémoires.
H.	Harappa.
I.	The introduction to the present volume.
J.R.A.S.	Journal of the Royal Asiatic Society.
L.	Left.
M.	Mohenjodaro.
P.	Certain unpublished photographs of impressions from Proto-Indian seals.
R.A.	Revue d'Assyriologie.
R.	Right.
E.G.	Egyptian Grammar.

INTRODUCTION.

The existence of the script dealt with in this work has been known to Orientalists for half a century, or more. But it was not till the Archaeological Department of the Government of India took in hand the systematic excavation of the ancient sites now known as Harappa and Mohenjodaro that any considerable number of texts was forthcoming. Even now the texts we possess, though numerous, are very short, being mainly confined to engravings on seals. No stelae have as yet been found.¹ Nevertheless it is felt that the texts at our disposal are sufficiently numerous to justify the present attempt to collate them and classify their signs, and draw certain inferences regarding the nature of the script. Plates I to XXXVII indicate the extent of the discoveries of inscribed objects up to the close of the excavating season - late February - 1927. They are reproductions of autographic copies made by the writer at the Museums of Mohenjodaro and Harappa during March and April 1927. They reproduce, then, all the script that we at present possess with the exception of the following, which have already² appeared elsewhere:-

1. Nor have we a single example of the clay tablet, so common in Mesopotamia.
2. Except no. 11, below, and the few texts which in the Tables appear with their number preceded by P in col. II. These are taken from unpublished photographs to which the author has had access.

11. U 目 (A P 1

Not yet published.¹

12. 𐎶 𐎠 𐎡 𐎢 𐎣

A.S.I.A.R. 1923-1924, Pl. XIV.²

13. 𐎶 𐎠 𐎡 𐎢 𐎣

" " " Pl. XIX.

14. 𐎶 𐎠 𐎡 𐎢 𐎣

"The Times", Feb. 26th 1926.

15. 𐎶 𐎠 𐎡 𐎢 𐎣

The Illustrated London News,
Oct. 4th, 1924.³

16. 𐎶 𐎠 𐎡 𐎢 𐎣

" " " "

17. 𐎶 𐎠 𐎡 𐎢 𐎣

" " " "


18. 𐎶 𐎠 𐎡 𐎢 𐎣

" " " "


1. Copied from the original in the Louvre Museum. The original is a seal, circular, of stone dark green in colour. The signs are written in the upper semicircle parallel to the circumference. The lower semicircle shows a bull.

2. Nos. 12 to 35 are reproduced here with the signs as they would read on an impression. The photographs in the Illustrated London News reproduce the actual seals. Those in the A.S.I.A.R. and the 'Times' do the same.

3. The Illustrated London News published other seals besides those given here. Their texts will be found on Plates I to XXXVII among the others, being copied direct from the originals in the Museums of Mohenjodaro and Harappa.

19. '0' X' /X


The Illustrated London News,
 Oct. 4th, 1924.

20. V F L III III V " 

" " " "

21. " L X "


" " " "

22. Y III A O


" " " "

23. X 

" " " "

24. V (S) V

 V V

" " " "

25. 

The Illustrated London News 4-10-24.¹

26. X O A V U X X

" " " " "

27. 自 X 

" " " " "


28. E V 

" " " " "

29. Y IIII X V 

" " " " "

1. Nos. 15-19, 21, 23, 25, 27, 29, 30, were republished in
 Archaeological Survey of India, Annual Report, 1923-1924.

in depicting the same object. A closer examination will establish that it is precisely the commoner signs of our texts that are the most distinctive - e.g. 

At the same time it would be rash, in the present state of our knowledge on the subject, to rule out of court the hypothesis of a common descent from some remote ancestor for the script of Harappa and any other pictographic script. We know so little, after all, of the ultimate pictographic ancestry of any script, even Sumerian.

Let us now refer briefly to circumstances and considerations that should be borne in mind when examining this script.

Race. It is not likely that the originators of the script were Aryans, since the latter are not believed to have entered India before 1200 B.C., at the earliest, whereas the script, as proved by Mr. Mackay's find at Kish,¹ existed many centuries before that date. It is probable that the Indus Valley prior to the arrival of the Aryans was inhabited by Dravidians, and that the Brahuīs of the neighbourhood are a remnant of this stock; but this is not certain, nor would it exclude the possibility of a riverine or maritime folk of a different race being responsible for Mohenjodaro and Harappa.

There is a natural temptation to look for a connecting link between the agglutinative languages of ancient Sumer and Elam and the agglutinative languages of Modern India; and in this connection not only Brabui is of interest, but also the ancient tongue so far represented by a solitary cuneiform inscription from Herat.² It is of course obvious

1.

2. See Sayce. Antiquity. June 1927, p. 206.

that the finding of a linguistic connection between Sumerian or Anzanite or the language of the Herat seal on the one hand, and any modern language of India of pre-Aryan origin on the other, taken in conjunction with the undoubted fact of intercourse between India and Sumer and Elam, would be a likely clue to the identity of the language of our inscriptions. But so far this connection has not been found. Meanwhile, in looking for it the peculiarities of the Kunda languages should not be ignored. That their present speakers are even more primitive than the Dravidians is historically not repugnant to the possibility of their ancestors having evolved an elaborate civilization five thousand years ago.


It is unfortunate that little information of an ethnological order has been yielded by the excavations:—a few skeletons, the position of which leaves it open to doubt whether their owners were not the victims of a medieval 'dacoity'; and a couple of busts of which Sir John Marshall has stated that their heads are unlike those of any modern race of Indian. But one would like to know whether any anthropometrical survey of the region has been made, and especially of the predominantly Brakmi tracts of Baluchistan.


However, it is equally possible that the people of our script were a seafaring race, foreign to the India into which they had penetrated up the navigable Indus and its affluents. In support of such a contention it might be urged that the sites so far known of this civilization are confined to the banks of navigable rivers; that the fish (?) sign is peculiarly in evidence in their script; that they certainly brought bitumen overseas (from Mesopotamia?) for the burning bath at Mohenjodaro; and that while an abundance of seals have been found which were certainly used for stamping the sealings of merchandise, as is proved by the sealings acquired by V. Scheil (no. 3 above), which still bear on it the traces

of the fabric to which it was attached, such sealings are noticeably absent among the finds at Mohenjodaro and Harappa; suggesting that the seals were principally employed for stamping merchandise destined for abroad, and that Mohenjodaro was a great emporium.

It is also to be remarked that the houses are all small and surprisingly uniform in their dimensions, and that nothing resembling a king's palace has so far been discovered. This would also seem to point to a democratic (or oligarchic) trading community rather than to a native monarchy. Were these people the Phoenicians of the East? There are times when one is almost tempted to credit the legend of a lost Atlantis, placing it, however, rather in the Pacific and around Easter Island than in the Atlantic, and to wonder whether there, in early times, did not arise a Neolithic civilization and neolithic script which, spreading thence West and East overseas was the ultimate parent alike of Central American and Indo-Sumerian civilization. One thing that is certain is that there was much more travel and intercourse in archaic times than has been generally supposed. The history of navigation, from the time when the ocean-going ships of Tyre were succeeded by the coasting galleys of Athens down to the days of the Northmen, seems to be one of decay rather than progress. But before the Phoenicians it would seem to have been otherwise, and what was a daring voyage of discovery for Nearchus was perhaps a commonplace of normal trading for the sailors of Mohenjodaro. Indeed, it is possible that the sailors of Mohenjodaro embarked upon voyages much longer than that from the Indus to the Euphrates. I would invite a comparison of the seal¹ published as

1. Provenance Crete, part of the Demargne collection, D.C.C.O. p. 94. There are several similar 3-faced, prismatic seals from Crete in the Ashmolean Museum, Oxford.

No. 13, a, b, c, d, (A 28) on plate 52 of M. Delaporte's Musée du Louvre, Cylinders et Cachets Orientaux, with the triangular prismatic objects of similar size found at Harappa (Pl. XXX, Nos. 62-83). The design on the side 16R of this Cretan seal may be compared with  (see Table LXXI, col. IV) in Proto-Indian texts.

Date. Seals like the one found by Mr. Mackay have been found in abundance at various levels at Mohenjodaro and Harappa. The square seal portraying a bull, with one horn visible, standing in profile (facing right), with the symbol  in front of his fore-feet, and the text written horizontally across the upper portion of the face of the seal¹, is the commonest find at either site. Now this is the only Indus Valley find in Mesopotamia that can be approximately dated, unless we accept as of Indian provenance the seal found recently by Mr. Woolley, and accept also the genuineness of the cuneiform characters it bears. The latter, which was recently on temporary exhibit in the Assyrian basement of the British Museum would appear to belong to the third millennium B.C. The Kish seal also is not later than 2000 B.C. Meanwhile in India itself, while there is evidence of intercourse with Mesopotamia,² that evidence is insufficient to enable us satisfactorily to date any particular stratum of the ruins. There are a few square seals of black marble, similar in shape and size to those found in Mesopotamia of the archaic period. Some of these bear no legend, and have therefore not been included in these plates. But the ordinary

1. See Plate I, No. 390.

2. Some of the pottery shows affinities with that of Monassian, of Susa of the second period, and Jemdet Nasr, circa 3500 B.C.

square seal with inscription, that has been yielded in hundreds by Mohenjodaro and Harappa, is different as to material, shape, and the ring attachment on the reverse from these archaic seals. On Sumerian and Elamite analogy, then, one would be inclined to ascribe the archaic-looking seal to the fourth millennium B.C.; while on the evidence of the Kish seal one would ascribe the ordinary seal with ring attachment to the third millennium and perhaps to part of the second also. This does not preclude the possibility of their survival into a later period.

The few circular, flat, clay objects, sometimes bearing a stamped inscription, and in appearance not unlike Phoenician Tesserae, which have been yielded by the excavations, may be of later date. There are objects very similar in appearance from Susa, exhibited in the 'Salle dite de Mastaba' of the Louvre. Another object apparently of late date is the fragment of a silver bar shown on Plate XXVII (No. 518). If the signs thereon are cuneiform of the 'nucleiform' variety, as they appear to be, it would seem that here we have a Babylonian export of comparatively late times. And this is about all the material we at present possess that can assist us in dating our texts.

It is clear then that we have no ascertained upper and lower limits, except that the lower limit was probably pre-Buddhist since a Buddhist stupa of the third century B.C. crowns the acropolis (?) of Mohenjodaro. Again the complete absence of Achaemenid remains at Mohenjodaro suggests that it was evacuated at latest before the establishment of Persian rule in that area. The upper limit may well be beyond 4000 B.C. The considerable depth of superimposed buildings all in burnt brick, evidently of successive epochs, which the excavations at Mohenjodaro have revealed suggest that

this civilization had a very extended duration. It is true that the script seems to have undergone remarkably little transformation throughout the period. But this need not surprise us when we remember the history of the monumental script of Egypt. The comparatively rapid changes in Mesopotamian cuneiform may be attributed partly to the invention of the clay tablet, and partly to the influence of foreign conquerors with no interest, religious or national, in preserving either current forms or ideographic values.¹ But in the Indus Valley the negative evidence is clear that the clay tablet failed to establish itself, while there is no positive evidence of foreign conquest. The various successive cities of Mohenjodaro do not appear to have been burned.

Language. If as I think Professor Langdon is right in deriving the Harappan script from that of Sumerian and Akkadian,² it follows that some of the Harappan signs had acquired phonetic values by the time they were borrowed by the Sumerians - that is, it is equally possible - by an earlier race was passed down on to the Sumerians. But little else follows. It certainly is a bad policy with the "Italians" of Harappa and Mohenjodaro to go on comparing - as Oriental scholars appear to have done - the signs with those of the Phoenician alphabet. The possibility that the people of Mohenjodaro were the ancestors of the Phoenicians has already been suggested.

Civilization. The people of the Indus Valley were in front of present civilization similar to that of Mesopotamia and

1. Cf. the evidence of cuneiform in the Assyrian script in the days of Sargon.

2. Langdon also suggests that the signs resembling those of Sumerian and Akkadian were the result of borrowing.

3. In an earlier paper on Mohenjodaro.

Babylonian contemporaries. Their brickwork¹ is excellent; especially in the construction of their drains, which remain watertight to this day. Incidentally the size of the surface drains suggests that the rainfall, if seasonal, was heavy. Perhaps the monsoon visited Mohenjodaro in those days. There is no inherent meteorological improbability. In 1926 Karachi received over 10 inches of rain in two successive days, though the normal annual rainfall in modern times is under 10 inches. The apparent absence of irrigation works at Mohenjodaro would also suggest that in ancient times the rainfall was adequate. The presence of the elephant and the rhinoceros, and the absence of the camel in their glyptic designs supports the same conclusion. These people were clever craftsmen, working in many metals and stones. They made excellent pottery, which they decorated with taste. Some of these designs are still in local use today.²

Method of writing. The examples of direct writing that we possess are confined to objects of copper and stone.³ On clay we have only stamped impressions. But it is obvious that the literature of this people was not confined to the 700 odd seals and amulets etc. unearthed. The absence of lengthier documents among the finds suggests that for ordinary purposes perishable materials were used. That clay was not among them has already been inferred. Perhaps they utilised skins, as Herodotus tells us the Phoenicians did, perhaps papyrus or

-
1. It is interesting to note that in point of size and shape the bricks are similar to modern bricks, and quite different from the large square Babylonian brick. They resemble rather the bricks excavated by Professor Langdon at Jemdet Nasr. All the bricks are burnt. The finding of these perfectly-made, modern-looking bricks even at the lowest levels is one of the curiosities of Mohenjodaro.
 2. See an article by the writer in the 'Times of India, Illustrated Weekly', May 7th, 1927.
 3. Except for two signs scratched on a piece of pottery. See Pl. II, No. 21.

silk. The signs themselves, on some of our seals, suggest the influence of painting with a brush,¹ being splayed at the extremities. It is quite possible that here we have indications of a change of style due to the introduction of a new writing material, which, as future specimens come to light, may be of aid in dating our finds. The signs are traced vertically from top to bottom, and are arranged horizontally. The animal, in cases where there is an accompanying animal design, is usually placed immediately below the script, and faces to the right.² There are, however, some half-dozen cases in which the animal faces left.³ The large number of signs yielded, after allowing for probable variants, makes it clear that the script is not alphabetic. It was probably, like Sumerian, a mixture of the phonetic and the ideographic. The first point to determine in any attempt to elucidate the script is the direction in which it reads. In accordance with Egyptian usage one would expect it to begin over the head of the subjacent animal and read towards the tail, i.e., in our case, from right to left. And this, as we shall presently show, is what we do find. It is interesting to note however that in the body of our texts the animal designs face to the left;⁴ that is the script reads 'over their backs' so to speak, as in the Meoritic inscriptions. The anthropomorphic signs however face right.⁵ Another

1. See Pl. I, Nos. 29, 301, 409. There were several other examples showing an approach to this style of script. But it was not found feasible to reproduce in the autographs minute variations in the thickness of the signs.

2. It is of course to be understood that when speaking of direction in connection with seals it is always the direction of the impression taken from the seal that is intended.

3. Nos. 513 to 517.

4. See in particular Pl. XIV et seq. Nos. 277, 292, 365, 406, 451.

5. See Table XLIX,

observation is that the second line, when the space left by the subjacent animal permits, is frequently complete on the left; while, if sufficient signs to fill the line are not required, it is the space to the right that is left vacant. This in some instances is due to boustrophedon writing. But where we find two-lined inscriptions with both lines reading from the right, and in the second line a blank space left on the right, we may attribute this to an artistic or epigraphic tradition which required the end of the last line to contain the end of the inscription, just as the beginning of the first line contains the beginning of the inscription. The Sumerians evidently had the same convention. Reading from left to right they left the left end of the last line blank. Cf. Cudea, Cylinder A, Col. I, cases 6, 10, 14 - and passim in Sumerian inscriptions.

The dominant impression mentally registered after a survey of the sites and the remains of Mohenjodaro and Harappa, and especially of the inscribed objects, is that this civilization was independent: remarkably independent when its undoubted commercial connection with Mesopotamia is recalled. Consider the evidence of epigraphy alone. Among nearly 800 inscribed objects we have, to date, not a single inscribed brick tablet, cylinder,¹ cone or mace-head. This civilization vanished. How, when, and why is at present a mystery. The evacuation of Mohenjodaro seems to have been peaceful, and, judging by the comparative paucity of the finds of intrinsic value, deliberate. Probably a sudden shift in the course of the Indus - it is now four miles distant - was sufficient cause. But for the abandonment of the whole region a wider explanation must be sought.

1. The cylinder seal found at Susa is presumably the work of a Mesopotamian craftsman to the order of an Indian client.

Possibly progressive desiccation of the neighbourhood was the cause. Meanwhile, this civilization does not appear to have vanished without leaving any influence on its successors. As already stated, Professor S. Langdon detects its influence on the Brahmi script, Sir John Marshall on Hindu religious symbols. But for Colonel Waddell's supposition that the people of Mohenjodaro and Harappa were the ancestors of the Hindu Aryans there is at present no evidence.

In the present fragmentary nature of our knowledge it is not possible to arrive at any final conclusion regarding the Proto-Indian script and its affinities. The provisional conclusions that I have reached on an examination of the evidence are these:-

1. The script as we have it is mainly phonetic.
2. It had a pictographic and ideographic origin.
3. That origin was many centuries before 3000 B.C., as is shown by the highly conventionalised form of the majority of the signs at that date.
4. There are clear affinities with Sumerian and Proto-Elamitic, which, in the case of Sumerian, increase as the difference in date increases, i.e., the resemblance of the script of Mohenjodaro to that of Jemdet Nasr (3500 B.C.) is much greater than its resemblance to the Sumerian of contemporary date (3000-2000 B.C.), showing that the common ancestry (or mutual borrowing) of the three scripts dates to before 4000 B.C.
5. That the homomorphous signs (Table XLIX), which are invariably silhouette, and are thus in marked contrast to the Sumerian (which used the head, neck and bust, but never the complete silhouette) suggest borrowing from Egypt.
6. That the superficial (?) resemblances to Cretan, suggest the possibility of the existence in remote times of a

very widespread race using a single pictographic system of writing.



7. That the Brahmi, Sabaean, a portion of the Cypriote and a portion of the Phoenician scripts are derived from Proto-Indian, due in the last three cases to commercial intercourse by sea via the Arabian Sea, the Red Sea and the Mediterranean. It is possible that the Indians had the monopoly of seafaring as far as the Gulf of Suez, which would account for Hiram's eagerness for an alliance with Solomon that would allow the Phoenicians to establish a base at Eziongeber.¹

1. 3rd Kings, Ch. IX 26 - 28.


Descriptive Catalogue of the Texts.

Mohenjodaro.

Nos. 1 to 20. Stamped impressions.¹

No. 1. A lump of burnt clay, bearing in the centre the imprint of a complete seal. This is the only object of its kind hitherto found in India. The only other one known was found in Mesopotamia (see No. 8 of the introduction). Beneath the inscription is an animal in profile, facing to the right, with only one horn visible. Below his head is a symbol, probably . The majority of the inscribed seals of Mohenjodaro and Harappa portray an animal in profile facing right with either this symbol, or , or a plant, placed below the head. It is suggested that the animal represents a divinity, and that the accompanying symbol represents an offering. With regard to the meaning of the script, it is probable that the seals were intended to serve much the same purpose as the Mesopotamian cylinder seals, and that their legends are, therefore, similar in meaning. A reference to the sign-list will reveal similar sequences in signs on the seals Nos. M. 70, 232-234, 462-464, 477.

Nos. 2, 3. Flat rectangular slabs of clay. There is no design accompanying the legend.

4. A piece of clay, shaped like a button. The inscription on the front hemisphere is accompanied by a subjacent bull² with two horns visible, with the  symbol at his feet; beneath the inscription on the rear hemisphere is a rhinoceros (?)


1. All sizes are approximately as shown in the plates, except as otherwise stated in these notes.

2. The subjacent animal is always to be understood as facing to the right, unless otherwise stated.

5. Clay. No accompanying design. Face flat. Reverse convex.

6. Fragment of a small thin slab of clay. A decorative design is impressed on the reverse.

7. Thin clay slab.

8. Similar in shape to the small, three-face, prismatic objects that are common at Harappa (see H. 62-83, 87, 88). On each face the legend is accompanied laterally by an animal design; a bull with two horns showing, and the  . Clay.

9. Thin flat slab of clay.

10. Rectangular stamp on a fragment of pottery. The only instance of stamped pottery on these sites.

11. In shape a dice. Yellow in colour. Impressed on all six sides; on three sides two sets of parallel lines crossing each other at right angles; on the fourth side two parallel lines; on the fifth side a bull with defaced superscription; on the sixth side the text shown, with a bull subjacent. No. 12 is identical, while there was also a third dice similar, but without any legible script.

13. Clay. Face flat; reverse convex.

14. Circular. Face and reverse flat. Clay. Below the legend is a bull (?). On the reverse is a decorative design. This object is about 8 mm. thick. In shape and size it is not unlike a Palmyraean tessera.

15. Clay slab. The script and design on face and reverse are identical. The design - which accompanies the script laterally to the left - is apparently a rhinoceros.

16. Similar to 15. Clay.

17. Clay slab.

18. Three-faced prism of clay. The signs extend vertically over two faces.. The design¹ on the third face is most interesting as tending to establish the sacred nature of the bull on our seals, and also the orientation of our $\hat{\Lambda}$ signs. It is clear that the men are walking from left to right, holding the standards ^(Tables with offerings?) in front of them. Signs ^{Table XLIX. 63, 64. C. 1 DE} bear a strong resemblance to the last man (reading from the right).

19. Clay slab. Reverse, two goats.

20. Clay slab. The space to the right is occupied by a goat. Beneath its head is Υ . The reverse is identical.

The paucity of stamped clay at Mohenjodaro - some 18 articles - compared with the large number of seals - about 450 - is noteworthy.

No. 21. Inscribed pottery.

This is the unique example of inscribed (as distinct from stamped) pottery. The $\sqrt{\text{V}}$ is three inches in height. The signs are roughly scratched with a sharp instrument on a round plate, or dish, about 1 foot in diameter. Probably the owner's identification mark.²

1. See Plate I, No. 18c.

2. Cf. Harappa No. 61, where the signs are probably a builder's mnemonic.

Nos. 22, 23. Inscribed stone.

Fragments of black marble bracelets, or anklets. The signs are clearly and cleanly incised with a sharp instrument. These are the only examples at Mohenjodaro of direct writing (as distinct from the preparation of seals) on stone.

Nos. 24-61. Inscribed copper.

These pieces of copper, thin rectangular slabs about $\frac{1}{8}$ th of an inch thick, of a standard size, would appear to be pieces of money. As far as is known they are unique, nothing similar having been found in archaeological sites in other countries. On the reverse they bear animal designs similar to those on the seals. The writing is now difficult to read owing to corrosion. The fact that several of the inscriptions are identical suggests that they give the names and titles of rulers, of the issuing authority, or of the place of issue.

It is hardly possible that they give the value or weight of the coins, since we find entirely different legends on coins of the same size, weight, and material. Now it will be found on examination that almost all of the sign sequences found on these coins can be paralleled from the seals: indeed in two cases the complete legends are identical: viz. the coin M. 42 and the seal M. 481; the coin M. 54 and the seal I. 15. Similarly the sequences $\text{V}\text{V}, \text{V}\text{A}, \text{V}\text{D}, \text{V}\text{A}$,
 $\text{V}\text{H}, \text{V}\text{A}, \text{H}\text{A}, \text{V}\text{O}$, which are
 found at the end (left) of the copper-coin inscriptions, are likewise found at the end of the seal inscriptions, as a glance at the Tables will show; and the sequences HA ,
 $\text{A}\text{O}, \text{H}\text{V}, \text{A}\text{H}, \text{H}\text{V}, \text{H}\text{A}, \text{H}\text{A}$ which are found
 at the beginning (right) of the copper-coin inscriptions are likewise found at the beginning of the seal inscriptions.

It is clear then that we have on the coins the same kind of inscription as on the seals, and, from our universal experience of seals in all countries and all epochs, this can only be Proper Names. So then the copper inscriptions set forth the names, titles, or styles of the persons who issued the coins, probably the rulers of the state. With this thought in mind we may re-examine nos. M. 24-31. It will be shown later¹ that $\nabla \nabla$ is but a 'spelling-out' of ∇ . Nos. 24-31 then are identical, and might have all been written as Nos. 30 and 31 ∇A . . . These signs are to be read from right to left.² They probably constitute the ruler's style. The last sign is so generally last as to be almost certainly a suffix. The first sign is very like the Hittite sign for 'King', and the second like the Hittite sign for 'land'. One is tempted to regard the ∇ as the suffix of the genitive case and read 'King of the land'.³

Another conclusion that may be drawn from these copper plaques is that the signs used in our inscriptions are independent of the accompanying animal design. Nearly all these coins have an animal design on the reverse, in some cases too indistinct to determine; but No. 30 has clearly an elephant, while No. 31 has something quite different. But their legends are identical. No. 43 has an animal looking like a reindeer, with three plants or trees at his feet; no. 44 shows a hare. Other designs, as far as I was able to discern them, are the bull⁴ (in 32, 33 the head is turned to look backwards towards the tail), a tiger⁵ and a goat.⁶ The

1. In the analysis of Table 1.

2. See pp. 31 et seq.

3. But see page 55 below Note 1.

4. Nos. 25-29, 32, 33, 48, 51, 53, 55, 57.

5. No. 60.

6. No. 61.

seals also witness to the mutual independence of the animal designs and the legend.

No. 62. Terra-cotta seal.

This is the only example at Mohenjodaro of a terra-cotta seal.

No. 63. Copper seal.

An incised piece of copper, in shape quite unlike Nos. 24-61, some 4.5 cm. long, 1 cm. wide and .75 cm. thick. The inscribed face is flat, the back rounded. From the reversed orientation of the writing on the original it was clearly intended as a seal, and I have autographed it accordingly as from an imprint.

Nos. 64 to 123. Stone Rectangular Seals.

Mostly of limestone or steatite. The inscribed surface is flat but the reverse is convex, varying in thickness from 2-3 mm. at the edges to 7-12 mm. at the centre. At the centre they are perforated breadth-wise by a single hole. There is no accompanying design either on the face of the seal or elsewhere. The rectangular pieces of stamped clay (see ^{discussion of} Nos. 1-20) were probably obtained from seals similar to these. It will be noted that on the seals, as on the copper coins, the commonest final sign is ∇ , and the next commonest ∇ (with variants).

Nos. 124-126.

Similar to Nos. 64-123; but not perforated.

Nos. 127-129.

Similar to Nos. 64-123. Perforated; but with flat instead of convex reverse.

Nos. 130-132.

Similar to Nos. 127-129; but inscribed on reverse as well as face.

No. 133.

The top and bottom sides are blank.

Nos. 134-141, 143, 145, 147-153.

Seals of the same type as Nos. 155-437, except that there is no visible design accompanying the script.

No. 139 is interesting, as being the longest inscription hitherto found, and the only one running into three lines.


Nos. 142, 144, 146

have not got the usual perforated projection on the reverse. Nos. 144 and 146 are peculiar as to size, and are correspondingly thin, (about 2 mm.). They are of the size shown in the plate.

No. 154.

Grey limestone. Circular. Flat. Inscribed on face and reverse. Unperforated.

Nos. 155-437.

Square. Surface flat. Sides perpendicular. Thickness from 5 to 10 mm. Reverse flat except for a perforated projection or attachment. Mostly white, yellowish, or light grey in appearance, and composed of limestone or steatite. These seals are remarkably uniform in their proportions, and appear to be of standard sizes. They are all accompanied by the bull, standing in profile and facing right (See Plate I, No. 390). One horn and one ear only are depicted. The bull in these seals is invariably of the European and not the Indian type. The horn is usually shown plain without the parallel 'shading' shown in No. 390. Beneath the head almost invariably appears the symbol , the principal varieties of which are given on Plate I. This is the distinctive seal of both Harappa and Mohenjodaro, outnumbering all the other seals. It will be observed that nearly half

of these seals and with the sign U .

No. 439.

The peculiarity of this seal is that the boss on the reverse side is inscribed with the sign U)

No. 440.



The face and reverse have the ordinary bull design. The top and bottom sides are blank and perforated by a hole, for stringing the seal.

Nos. 441 to 509.

Square seals, similar in shape and appearance to Nos. 155-437, but with different designs accompanying the legend.


441-456. Design, Indian bull (see Plate I, No. 449).


457-475. Design, as in Plate I, No. 453.

476. The Indian bull, but in place of  we have the symbol , apparently a plant or tree.

477. Design as in Plate I, No. 453. Inscribed on the upper edge as well as on the face.

478-487. Design, an elephant (see Plate I, No. 478).

488-494. Design, an animal resembling a rhinoceros. Before the forefeet the symbol  .

495. Design, a boar (?) with  .

496. Design, a beetle (?).

497. It seems doubtful whether the sign shown in the plate is intended as a legend. Accompanying it is a three-headed goat.

498. Design, a crocodile.

499. The left side of the square contains a tree; the lower half a dog (?)

500, 501. Design, a tiger (see Plate I, No. 500).

502. Design, a deer.

503. Design, an animal difficult to identify.

504. The script is at the bottom of the seal, most of the remaining space being occupied by a tree (See Illustrated London News, 27-2-1926).

505. Below the script, from right to left appear a horned lion, a horned man, and a tree. The lion and the man face right.

506. The middle space is occupied by a decorative design.

507, 509. Design, a fictitious animal with two horns and a trunk.

508. The left side is occupied by a tree. The lower half of the seal contains a tiger.

Nos. 510-512. Circular seals.

510. Design, bull. Similar to seal in the Louvre (see Introduction, page 3, no. 11).



Nos. 511, 512. Fragmentary. The design in each case seems to have been a central circular body, from which protruded several heads. There would appear to have been seven on No. 512. Of the four heads visible, two possess two horns apiece, the third possesses one, and the fourth none. If the remaining three heads (?) possessed 2, 2, and 1 horns respectively, we have here perhaps the beast 'with seven heads and ten horns' familiar to the writer of the Apocalypse.

Nos. 513-517.

Square seals, with animal designs, similar to those already noted, but with the subjacent animal facing left. It is possible that here we have examples of engravers¹ mistakes, as is not unknown in Mesopotamia, the animal and legend being engraved as though for direct vision instead of


1. Cf. D.C.C.O. Planche I, No. 7a (T. 13).

for viewing on an impression.

513. Design, bull. One horn visible. In place of the symbol  we have an object  ; apparently a plant. Compare this with the signs in Col. IV of Table XVII.

514. Bull as in Pl. I, 390 (but facing left).

515. Design, an animal not identified, with one horn visible.

516. An animal with two horns, spread thus  1.

517. Design, the hind-quarters of a bull are visible.

Harappa.

Nos. 1-83.


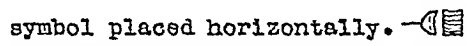
It was noteworthy that at Mohenjodaro the inscriptions other than seals were practically confined to copper coins. At Harappa, however, while we have only one copper coin, we have a fairly large collection of inscribed ^{na co-ic-tu (2) Volsa fable (2)} That they are not seals is shown both by the orientation of the signs and by the nature of the incisions. They are, for the more part, thin whitish slabs of limestone; very brittle, and less than $\frac{1}{8}$ th of an inch thick. It will be observed that, while they contain few signs that do not also occur at Mohenjodaro, there is a marked difference in the frequency of certain signs and sequences of signs. But if these objects are receipts it is not surprising that their legends should differ from those of the seals. In particular we may note the rarity of the final ∇^f in these texts; the fact that nearly all these objects are worked on the reverse² as well as the face; the appearance of new shapes of certain signs, e.g. the ∇^f is frequently written ∇^f . The objects are all flat³ as to both face and reverse.

-
1. The horns, when two are drawn, are always depicted frontally, not in profile, but this is the only pair of horns showing this particular shape.
 2. If the reverse is not shown in the plates it is to be understood that it is blank, unless the contrary is stated in these notes.
 3. Except as otherwise stated in these notes.

Nos. 28, 29. While the face is flat the reverse is spherical.






No. 23. On the reverse a crocodile.

No. 33. Square seal. About 8 mm. thick. Perforated attachment on reverse. Beneath the legend are a few indeterminate scratches. This text belongs to the group Nos. 123-243.

Nos. 40, 41. Cylindrical in shape. The space to the left on the reverse sides is occupied in the originals by the  symbol placed horizontally. 

No. 42. Cylindrical; a hard dark-coloured stone. The reverse shows a divinity in a shrine (?).

No. 45. Cylindrical. Reverse: a tree.

No. 53. Reverse, a crocodile, with the sign  held vertically in its jaws, and accompanied by the sign  written horizontally  in each corner. This would seem to establish definitely that the sign  is a fish, and  a differently written variant.

No. 61. The signs are about three inches long on the original, which is a fragment of a large circular stone that may have served as a door-socket.

Nos. 62-83. Small three-faced prismatic objects of limestone. Unperforated. All three faces are worked (except in the case of No. 80) bearing either inscription or design or both. They are shown complete with design on Plate XXX.

Their significance is discussed in the analysis of Table XXXVI.

Nos. 84-86. Copper.


No. 84. A copper coin, similar in shape to those found at Mohenjodaro.

No. 85. A broken slab of copper about $\frac{1}{8}$ inch thick.

No. 86. The signs shown in the plate appeared on a copper dagger about 5 inches long. There were several other copper daggers in the Museum, but they had not been cleaned and so were illegible.


Nos. 87-122. Impressions on clay.¹

No. 87. Three-faced prism, two faces of which are covered by a single pair of signs.

No. 89. Reverse, a plant  .

No. 90. Cylindrical. The space to the left of the legend on the reverse is occupied by a plant.






No. 92. Reverse, a plant.


No. 93. Reverse, the space to the left is occupied by a bull with two horns standing over the  symbol.

No. 95. Face, the space on the right is occupied by what appears to be a hare. There are six of these slabs all found together, identical in all respects, including a pronounced twist that was given to the slabs before burning. From this it is clear that a number of these slabs were prepared, impressed with the same seal and then baked together. These stamped clay slabs, manufactured en masse and bearing the owner's name on face and reverse can only have served as votive tablets. Doubtless they were placed before the family god to keep him in mind of the householder's prayers.

No. 101. Fragment of a ring. The legend is on the concave surface.

No. 102. Cylindrical. On the reverse is a centipede.

No. 105. Two identical specimens. The reverse contains a design that recalls the  .  :  :  :  :

No. 107. This gives a clue as to the nature of the  motif. It is clearly a religious emblem or offering that can be carried in procession like a standard. Compare Plate I (M.) 18.

No. 109. Reverse: a plant.

1. Flat slabs unless otherwise stated below.

No. 110. Face: the space to the left is occupied by a human figure with tail, standing extreme left and facing right. Facing him is a seated figure with raised arms and long hair. Reverse: the space on the left is occupied by two felines, standing on their hind legs and facing one another. The space on the right is occupied by a man seated up-side down. Suspended from his legs is a large insect.

No. 112. Reverse: in the space on the extreme right is a plant.

No. 115. Cylindrical.

Nos. 116, 119. Cylindrical. Reverse: a crocodile.

No. 121. Reverse: convex.

No. 122. The lower half of the face shows a bull.

Nos. 123-137. Limestone and steatite. Inscribed on the face only. The shape is as shown in the plates, except that Nos. 126, 130 and 133 are squares. The rectangular shaped seals have convex backs, as in the similar seals from Mohenjodaro (M. 64-123), and they are similarly perforated. No. 129 shows one of these. The 'o' in the middle of the reverse is not a sign but the hole that perforates the back of the seal. The square seals have the usual ring attachment. No. 137 is of black marble.

Nos. 138-149; 152-161. Inscribed on the reverse as well as the face. They are not perforated and are similar in appearance to the inscribed objects Nos. 1-60, to which group they belong. They are not seals.

Nos. 141, 144. Four-faced prisms.

No. 145. Face: in the space to the right appear five swastika signs in a row. Reverse: in the space to the left appear a man and a tiger.

No. 150. A square seal. The face contains a bull but no legend. The reverse is blank.

No. 151. A square seal of black marble.

Nos. 162-227. Square seals. Mostly limestone and steatite. Perforated boss as back, same as Mohenjodaro. Design exactly as on the Mohenjodaro seals nos. 155-437. (Plate I, no. 390). We also note the same sign sequences as at Mohenjodaro. Clearly the same language as well as the same script prevailed at both places.

Nos. 228-231, 233, 234. Rectangular seals. Flat. Worked on face and reverse.

No. 229. Reverse: tortoise (?).

Nos. 228, 230, 231. Reverse: crocodile.

Nos. 232, 235. Stamped clay: cylindrical in shape.

Nos. 236-239. Square seals, like nos. 162-227, but showing a bull with two horns.

No. 240. Square seal. Design: elephant.

No. 241. Fragment of a square seal. The space to the left contains seven men in a row, each holding the one in front of him by the hand. The men are looking to the right.

No. 242. To the left of the script (?) is a tree, to the right an animal.

No. 243. Flat square seal. Reverse also flat, no ring attachment. It is also without the clear cut rectangular sides of the ordinary seal. It is perforated throughout its breadth by a hole. It thus resembles the archaic seals of Mesopotamia. It is doubtful whether the sign ⑥ on this seal is anything more than a decorative device,

THE DIRECTION OF WRITING.

The orientation of the Proto-Indian script is, in the large majority of cases, from right to left, i.e. the signs are placed successively in a horizontal row starting from the right. Evidence of this is afforded by a comparison of the sequence of the signs in texts containing two or more lines on the same face, with the sequence in single-line texts. Attention may first be directed to the single-line texts containing ∇ as their left-hand sign. Of these there are 177 at Mohenjodaro and 31 at Harappa (see the Plates passim, but especially V, VIII, IX, X, XI, XII, XIII.) It is clear that a large proportion of our texts - nearly one third - either begin or end in ∇ . Now examine M. 303, 516, 391, 365. In M. 303 ∇ being the only sign in the second line is clearly the last sign. If then we read the script from left to right we must place ∇ at the extreme right of the text and read $\Psi \square \hat{x} " \& \text{X} \text{X} \nabla$ which gives us the sequence $\text{X} \nabla$ which is found nowhere else; whereas if we read the script from right to left and place ∇ at the extreme left we get $\nabla \Psi \square \hat{x} "$ etc. a sequence of four signs which occurs no less than five times elsewhere - M. 184; 89: 124; 9; and H. 90. - while the three signs $\nabla \Psi \square$ occur in a dozen other texts (see Table I nos. 49-65). Treating M. 516 the same way we get $\nabla \text{X} \text{X} \text{X} \nabla$ which not only gives us ∇ in its common position but also the sequence $\text{X} \text{X}$. Now it is significant that the only other occurrence of the sign X , viz. M. 447, shows precisely this sequence. There can be little doubt then that both the lines in M. 516 are to be read from right to left (starting of course with the upper line). It is not to be inferred that the second line is always to be read from right to left. Cases of boustrophedon writing, th

apparently rare, undoubtedly occur. M. 391 is a case in point. While the upper line reads from right to left the lower one reads from left to right. This reading gives us $\mathcal{V} \alpha \mathcal{E} \mathcal{U} \mathcal{U} \mathcal{U} \parallel$

No other reading is tenable in face of the

evidence of M. 161; 162; 462; taken in conjunction with the evidence of Table LII, which shows $\mathcal{V} \alpha$ nine times and $\alpha \mathcal{V}$ not once. No. M. 365 however is clearly not boustrophedon.

That the second line in this text is to be read in the same direction as the single-line texts is clear from the sequence

$\mathcal{V} \mathcal{V}$, which is found eleven times, while $\mathcal{U} \mathcal{U}$ is nowhere found. The two lines of M. 365, then, are to be read in the same direction. That this direction is from right to left is indicated by the position of $\mathcal{V} \mathcal{V}$, which in single-line texts is found almost invariably as a left-hand group. (See Table VI). We may now examine the other inscriptions containing more than one line on the same face. M. 139 is our longest in-

scription containing three full lines of script. Each line is to be read from right to left. In the case of the first line this is proved by the sequence $\uparrow \mathcal{A}$ which is one of the commonest sequences in our texts, occurring twentyone times (see Table

LXVIII). In the case of the second line it is proved by the sequence $\mathcal{V} \mathcal{U}$, to which we have already referred; and in the case of the third line by the sequence $\mathcal{Y} \mathcal{A} \mathcal{V}$, which occurs elsewhere five times, while its reverse $\mathcal{A} \mathcal{V} \mathcal{Y}$ is nowhere found.

Regarding M. 141, the position of $\mathcal{V} \mathcal{B}$ as a right hand sign makes it probable that the first line reads from the right. Regarding the direction of the second line there is no evidence, as the signs thereof are nowhere else found in association.

M. 151. The first line shows a sequence normal in single line inscriptions (see Table XXV), and therefore reads from right to left. Regarding the second line the evidence is scanty.

\diamond and \mathcal{P} are not elsewhere found together, and the only

instance where 𐀓 and 𐀘 are found is H. 44. But as shown in the analysis of Table LXVI 𐀘 and 𐀙 are not variants of the same sign. However, they probably represent allied sounds, as is explained later, and it is possible that the $\text{𐀘} \text{𐀓}$ of H. 44, and the $\text{𐀓} \text{𐀘}$ of M. 151 are the same word with a dialectal variation of pronunciation. There are many such instances of dialectal variations recorded in the script, as we shall see. Provisionally then I have assumed that we have in H. 44 and M. 151 the same word, and have accordingly read the second line of M. 151 from left to right.¹

M. 162. The first line is from right to left. This is clear from the four signs on the left, a sequence we have already examined under No. 391. The second line also reads from right to left. If we read it otherwise we have 𐀙 final preceded by 𐀓 , which is nowhere found, whereas $\text{𐀓} \text{𐀙}$ is found in seven other cases. (see Table XC.)

M. 450. The sequence " 𐀙 " on the right of the first line is one of the commonest in the script. It occurs in this position in single line inscriptions thirty times, or if we treat 𐀙 as a variant of 𐀙 sixty-eight times (see Table XXIV). It is clear then that the second line is to be read to the left, not to the right, of the first line, therefore the reading of all single line inscriptions with " 𐀙 " or " 𐀙 " on the extreme right are to be read from right to left. Taking these inscriptions together with those ending in 𐀓 , we have no less than 247 inscriptions which demonstrably read from right to left. This may be accepted as conclusive evidence of the normal direction of the writing at Mohenjodaro and Harappa, at least as

1. In the tables I have written out the texts with more than one line as they would have been written had the scribe placed all the signs in one line. This was essential for purposes of comparison. The reader can readily discover whether any given text in the Tables has more than one line by referring to the list immediately preceding the Tables.

regards single-line inscriptions and the first line of multiple-line inscriptions. It remains to consider the direction of the writing of the second line in the remainder of the inscriptions with more than one line, i.e. to determine how many of them are, like Hittite, boustrophedon. In regard to no. M. 450 there is virtually no evidence. 𐎶 is never found followed by 𐎶 and only once by 𐎶 (M. 40) and that in a context where the latter sign clearly associates with the sign preceding it and not with the 𐎶 . Still in this, as in all cases where no evidence is obtainable from sign sequences in other texts, I have for purposes of transcription assumed a right to left reading, as this is the reading on the majority of second lines where the direction can be determined.

M. 193. Not boustrophedon, as 𐎶 is never found as a final sign. (see Table XXI).

M. 230. Not boustrophedon, since (i) 𐎶 is never final, (ii) 𐎶 medial is found in M. 355, (iii) 𐎶 final is found twice (see Table XCIX).

M. 341. Probably boustrophedon, since 𐎶 is often final (Table LXVI) while 𐎶 only once (Table LVI). Neither sign is found elsewhere following 𐎶 , so that the evidence is very slight.


M. 232. Boustrophedon, since 𐎶 is a common sequence (see Table XLVI and its analysis).


M. 417. Not boustrophedon, since 𐎶 is found elsewhere followed by 𐎶 and 𐎶 is found similarly preceded by 𐎶 while no element of a sequence 𐎶 is found anywhere.¹





M. 447. Not boustrophedon in view of the sequence 𐎶 Cf. M. 516 discussed above.





M. 455. Not boustrophedon, since 𐎶 is never final (see Table XXXI) whereas 𐎶 is, as already noted.





1. See Tables XI, XXVI.



M. 477. The third line is from right to left in view of the sequence  (see Table VIII).






M. 499. Not boustrophedon since  is final in M. 508 (Table XLIX).



M. 506. Read from the right    

M. 514.  is unique. But it is probably a defective form of . The latter is not found elsewhere associated with , but it does appear following  in M. 163. The evidence is thus very slender, but such as it is, it points to a boustrophedon reading.

H. 107. The top line reads from right to left. Cf. M. 20  . The bottom line is probably boustrophedon, giving with the reverse, which is from right to left, the sequence   which is fairly common. (see Table XLVI).

H. 241. The evidence is practically nil. If  is a variant of the  group then a comparison with M. 366 would suggest a right to left reading.

I. 24. The sign in the second line is clearly to be read to the left of the first line, and the signs in the third line to the left again. This gives us    as our final sequence. We have this sequence in H. 38; while   is a common final sequence as already noted.

M. 235, 257, 245, 353, 409, 492, 508, I. 19, H. 166, all contain a single sign in the second line. In every case the first line is to be read from right to left and the sign of the second line as the final sign. It will be noted that the second line sign in nos. M. 235, 409, I. 19, is a variety of , which in the single line inscriptions also is invariably final (see Table XXVII nos. 1, 3, 4); in nos. 245, 492, it is , which is also normally final (see Table XCIII), which is further confirmation that the script reads usually from right to left.

M. 133 is interesting as containing not only two lines on the same face, but legends on three other faces. By a comparison of the sequences with those found elsewhere the reading can be established as follows. Begin with top line of face, read right to left. Then second line of face left to right. Then reverse right to left. Then right side left to right. Then left side. It will be seen that the reading is boustrophedon throughout. Another peculiarity is that in the lines where the direction of the writing is reversed (i.e. left to right) the form of the non-symmetrical signs is also reversed, on the Hittite plan. Thus we have (𐎧 for 𐎡 (see Table LXXXII) (𐎧𐎧(for .)𐎧𐎧) (see H. 227).

The consideration of this inscription brings us to our next category of multiple line inscriptions viz. those that have only one line on each face, but have more than one face inscribed.

M. 132. Clearly boustrophedon. The face reads from right to left, while the reverse is clearly left to right, being the last three signs of the face reproduced in reverse order. Again the direction of the writing in ^{the} case is proved by the fact that elsewhere 𐎧 is invariably final (see Table LXIV).

H. 118. Boustrophedon. The face reads left to right, the reverse right to left. This is less surprising at Harappa than it would be at Mohenjodaro in view of the fact that at Harappa many of the single line inscriptions read from left to right.

In the remainder of these inscriptions the writing is in the same direction on each face and that right to left for the most part. Those in which the writing is from left to right (principally Harappa) are so indicated in the Tables by placing an asterisk against the inscription. For the most part the inscriptions on the different faces seem to be independent of one another. This is clearly the case in no. M. 132, noted above, where the inscription on one side is an abbreviation of that on

the other. An extreme form of this is M. 439, where the sign on the reverse seems to stand much as an initial does to a name. Again in some cases the inscription on either side is identical, viz. M. 16, 18, H. 145. A large proportion of the inscribed objects at Harappa have VIII or VIII on the reverse. It is clear that in these cases the reverse has no syntactical relation with the obverse. Returning now to the inscriptions with two or more lines on a single face: only in two instances M. 303 and 391 have we reason to suppose from the sequences that the signs in the second line form part of the word or phrase in the preceding line; while in some cases, notably M. 139, 193, 230, 453, it is almost certain that the sense of the first line is complete in itself, and that what follows is an additional name or title.

No. 139 indeed looks like a Sumerian 'burgul' seal, a seal with the names of three different men (perhaps as in Sumer, fashioned for the purpose, combining the names of the parties to a contract in a single seal). It is significant also that this seal alone of all the square seals bears no glyptic design, which again recalls the Sumerian contract seal.

It remains to remark that at Harappa there are several instances of single-line inscriptions reading from left to right. At Mohenjodaro there are only two (M. 513, 515).

THE CONNECTION WITH OTHER SCRIPTS.

The discovery of any new script at once suggests a search among existing scripts for possible ancestors or descendants. In pursuing this search one naturally first directs one's attention to those scripts which are (a) contemporary in date and from which there may have been borrowing, and vice versa, (b) those which are found in the same locality at an earlier date, (c) those which are found in the same locality at a later date. In the present instance category (b) is entirely wanting. In category (a) we have Sumerian, Proto-Elamite, Egyptian and Minoan. In category (c) we have Kharoshthi, Brahmi, and Sabaean. With regard to Kharoshthi its descent from Aramaic is proved. Not so, I think, in the case of Brahmi. It is true that Buhler's derivation of the Brahmi syllabary¹ from the Semitic scripts has long held the field. But it was never universally accepted. Cunningham in particular believed it to be derived from a lost pictographic source. A detailed refutation of Buhler's equalisations seems unnecessary in view of the positive evidence set forth in the Comparative Table (Appendix III). It will be seen that I accept certain of Buhler's equalisations with the Phoenician, but these are precisely the cases where it seems that the Phoenician signs themselves are probably derived from Proto-Indian. Now it may be argued that the interval of time between the disappearance of the civilisation of Mohenjodaro and the first appearance of Brahmi (c. 300 B.C.) is too great to make a direct descent probable. But what do we know concerning the lower limits of the Proto-Indian civilisation? The bricks of the Buddhist stupa at Mohenjodaro lie immediately


1. It is incorrect to speak of the Brahmi characters as alphabetic. No signs except the vowels stand for single letters.

upon Proto-Indian remains. Nothing has so far come to light to suggest that the Proto-Indian civilisation came to an end before the Aryan invasion. And it must be remembered that the script that we possess is all monumental - seals, sealings and coins. It is quite possible that alongside of this there may have been a demotic approximating more closely to the script of the Eran coin and Asoka inscriptions.

With regard to Sabaeen the time interval is less. And though the inscriptions may not antedate the sixth century, a much earlier date is claimed for the beginnings of the Minaean empire, and presumably for the origin of the script also. If distance is urged as militating against the probability of Sabaeen being derived from Proto-Indian, it should be remembered that the distance from the mouth of the Indus to the Sabaeen coast is less than 1000 miles, that the monsoon winds are absolutely reliable and sailing conditions ideal, making it possible during six months of the year to sail from Karachi to Aden with the shore almost continuously in sight without tacking once, and during the other six months to perform the same feat in the opposite direction. Again, both areas were known to the ancients as Ethiopian. In view of the fact that both the form and the names of some of the Sabaeen signs have not yet been satisfactorily accounted for, it has seemed to me legitimate and desirable to bring out in tabular form the undoubtedly striking resemblances between Sabaeen and Proto-Indian.

With regard to contemporary scripts:


















Many of the signs bear a remarkable resemblance to the monumental script of Ancient Egypt. The entire body of amorphous signs have Egyptian equivalents which are virtually

that are exactly paralleled in the Proto-Elamite and Jemdet-Nasr tablets, such as  that have no conceivable morphographic equivalent in Egyptian. One is bound to conclude that the presumption is strong that our script has been borrowed in part from Egypt, and in part from Mesopotamia.¹ Of course there is a considerable proportion of signs that are common to all three scripts, such as the signs for tree, fish, bird. But this is coincidental, and indeed inevitable in the very nature of pictography. It is only safe to draw inferences of causal connection where the less obvious and more conventionalised ideograms, especially those that are so conventionalised that their pictographic origin is hardly determinable, show a marked correspondence; and in a lesser degree, where easily recognisable pictographs show the same variations. Now the latter is very marked as between our script and Proto-Elamite, as will appear from a study of the Comparative Table.

The resemblance of our script to Proto-Elamite is closer than its resemblance to Sumerian. This is natural in view of the geographical proximity of Baluchistan to Elam. The resemblance to Sumerian is not really apparent till we reach the Jemdet-Nasr period. Now the script of that period (B.C. 3500) is so closely related to Proto-Elamite that Professor Langdon affirms a common ancestry of the two. This would seem to be confirmed by the evidence of our script, which approaches the Sumerian in similarity in measure that the latter approaches Proto-Elamite. One is led to the conclusion that the element in our script which was borrowed from Mesopotamia was borrowed at a period before the

1. This is just what we should expect, if, as has been suggested in the Introduction, our people were a race of overseas traders, like the Phoenicians.

separation of the Sumerian and Proto-Elamite scripts. Of course it is possible that all three had a common ancestry, and that the Egyptian element in our script alone was borrowed. It is even possible that all four scripts may have had a common origin. But this is an enquiry that does not concern us here, and which in the nature of pictography, would be very hard to solve without the aid of anthropological evidence as to whether or not there was in prehistoric times racial affinity between the inhabitants of the Nile, Euphrates and Indus valleys.

The connection between Proto-Indian and Proto-Elamite is so close that Professor Sayce has suggested that the languages may be allied.¹ This I have endeavoured to test. There is no doubt that our texts are entirely proper names (and titles). If the languages are allied we may expect identity of some at least of the proper names. Now in the Proto-Elamite tablets it is possible to detect the proper names with some degree of certainty: see the analysis of Tablet No. 490 by Father Scheil on page 30 of Vol. XVII Mémoires de la mission archéologique en Perse. Applying his method I have collated all the proper names occurring on the tablets in this volume and vol. VI containing certain signs that could be reasonably safely identified with Proto-Indian signs to see whether in any case the same sequence of signs could be observed. The method adopted was the same as that adopted in the preparation of the tables of Proto-Indian texts. The signs selected as possible equivalents of Proto-Indian signs were , , , , , , , , ; the various bird signs; , , , , , , , , and their variants.

Every occurrence of each of these signs in all contexts that could

1. See Antiquity, June 1927, p. 206.


















Analysis of The Tables of Signs.

Analysis of Tables I and VI.





it will be shown on the completion of the analysis of these tables that we have only 234 distinct signs, apart from compounds. Now the Brahmi script makes provision for 33 consonantal and 8 vowel sounds (ā (inherent) ā, i, ī, u, ū, ē, o). Now a syllabary consisting of 33 consonants each articulated with 8 following vowels would give us 264 signs. The number of syllabic signs required to form a simple syllabary of open syllables to represent Brahmi sounds 50 closely approaches the number of signs on our Texts that we may be moved to assume that our script is mainly a syllabary of this kind, as a first working hypothesis; provided of course we are previously impressed by the evidence of the Brahmi signs being derived from the Proto-Indian.¹ But this hypothesis has not been assumed before first investigating the script to discover whether an ideographic conception was tenable. It is not. There is clear evidence in Table I itself of the presence of phonetic elements. We may first take the sequence 𑀓 𑀔 . Of this 𑀓 𑀔 will be seen to be a simple variant. 𑀓 𑀕 (variant 𑀓, 𑀔) is clearly closely allied. For 𑀓, 𑀔 is followed by 𑀓 final or quasi-final² in every case save one (T. VI. 31) and 𑀕 with

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1. See evidence of Comparative Morphographic Table. It is not to be inferred that any relation between the language of the Proto-Indians and the Aryan of the Asoka edicts is implied. Sanskrit and Pali and the other Prakrits had by this time absorbed the phonetic elements, notably the cerebral sounds of the Dravidian population.
 2. The 𑀓 in Table VI Nos. 18-21 is an independent suffix. See analysis of Table LVIII.

its variants is similarly followed in every case save one (T. VI. 5). Now if we compare $\text{U}^f \text{U}$, $\text{U}^f \text{U}^f$ with U^f preceded by other signs, we shall find that of the 17 signs and sign-groups found immediately preceding $\text{U}^f \text{U}$, $\text{U}^f \text{U}^f$ no less than 16 are also found immediately preceding U^f alone, and that frequently. Compare T. I. Nos. 6-20, 22-38, with Tables LV, LXV, XXXIV¹, XCII, LIX, XIII, LI, XLVI, XXXI, LXXXIV, VII, XVI. In these 16 combinations the proportion of occurrences with an intercalated U or U^f to those without is as follows:













 3:8;	 3:7;	 1:4 ¹ ;	  1:1;
 1:7;	 2:3;	 2:1;	 1:4;
 1:1 ² ;	 1:5;	 1:3;	 1:6;
 1:2 ³ ;	 3:3;	 7:2;	 1:1.






There seems good reason to conclude that $\text{U}^f \text{U}$, $\text{U}^f \text{U}^f$ is a 'spelling-out' (as we so frequently have in Sumerian and Assyrian names) for U^f . It is probable that U^f , which is so often final, is an open syllable. The principle which we see in Brahmi of regarding the simple form of every sign as containing as inherent final \check{a} ; and the fact that to this day in the Indian vernaculars words that we should regard as terminating in a consonant (from their pronunciation) are always regarded by the Indian grammarians as possessing a final \check{a} and written accordingly; and the fact that in Sumerian, words appear to have been similarly so regarded, since the Sumerian never says lugal-na, lugal-ka but always lugala-na,

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1. See Analysis of Table XXXIV for identification of  with .
 2. It is possible that this bird sign is a variant of the bird sign in No. 21 of Table I. In that case the proportion will be 2:1, and incidentally all 17 of the signs preceding $\text{U}^f \text{U}$, $\text{U}^f \text{U}^f$ will have been found preceding U^f .
 3. For identification of  with  see analysis of Table XXXI.

lugala-ge etc., should make us be prepared to regard signs which are normally final (as \mathcal{V} is) as open syllables: while a sign which like \mathcal{V} , \mathcal{V} is never final we may provisionally regard as a closed syllable. If then $\mathcal{V}\mathcal{V}$ is a 'spelling-out' it is something in the nature of ak-ka. Whether this doubling of the consonant in the script had any counterpart in pronunciation (as in Assyrian) or not (as in Sumerian) is difficult to say. If it had it may well have been due to the quantity of the preceding vowel. The combination \mathcal{V} \mathcal{V} is peculiarly interesting. Not only from its appearance, but from the fact that it is always followed immediately by \mathcal{V} final, we may be sure that it is a compound and that one of its elements is \mathcal{V} . The other element is clearly \mathcal{V} (see Table XVI). It is equally certain that this compound is phonetic and not ideographic. If it were ideographic, then by all our knowledge of ideographic writing its meaning must necessarily be different from \mathcal{V} . How then shall we account for its being found invariably in the same circumstances as \mathcal{V} . But this is not all. \mathcal{V} and \mathcal{V} though closely allied as shown from their relationship to \mathcal{V} are not actually variants. This is clear from the regularity and difference of their antecedents. If we take \mathcal{V} as ak we may take \mathcal{V} as ek¹. Probably the selection of one or other of these syllables in the 'spelling-out' process was influenced by the quality of the vowel of the preceding syllables, a principle common to Sumerian and many languages - vowel harmony. Now it is surely most significant that these same alternations of \mathcal{V} and \mathcal{V} are observable in the compound formed with \mathcal{V} . If then

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1. It is of course to be understood that the selection of any particular consonant or vowel for purposes of illustration in the analysis of the Tables is arbitrary. For the selection of vowels see Analysis of table XXIX.

there is a difference of initial vowel as between  and  there is clearly a vowel difference between  and  . But if  be a full syllable in itself, as must be presumed, and if that syllable is fully pronounced in the compound, then, with this constant syllable intervening, the carrying of vowel harmony over and in spite of it on to  would be incomprehensible. But suppose that the syllable  is, on combination with  truncated, that it loses its vowel, that ba-ak becomes bak; ba-ek, bēk. Then everything is explained: the syllable bak' has become bēk under the influence of something antecedent. In other words the compound represents the contraction of an open and closed syllable into one 'compound' syllable, and the first element in the compound has been reduced to a mere consonant, it has lost its inherent ā, it is what the Sanskrit grammarians call halant. This is precisely the principle governing the formation of compound (Samyukta) signs in Brahmi and Nagari to this day. If we are right the sequence   (which twice occurs) is to be read ba-ka, while   is b'ak-ka; a mere graphic variant as in Sumerian.

With regard to the sign  and its variant form  , the latter is probably original, and may be taken to represent a pair of arms with hands. This is one of the signs that shows affinity with Egyptian. See Gardiner, E.G. p. 445.D.28. The sign  , which as we have shown is but  articulated with a different vowel, is morphographically so akin to  that it may well have arisen from it. This would imply the deliberate differentiation of signs to supply cognate phonetic symbols. There is abundant evidence of this elsewhere, as will be noted in the analysis of other Tables. In the present instance this differentiation will have been made by adding

to \mathcal{V} a horizontal stroke in each half,¹ producing \mathcal{V} . The further modification to \mathcal{V} , \mathcal{V} is probably of the gunu order, and without effect on sense or sound.² The deliberate modification of a given sign to provide a symbol for a cognate phonetic value would presumably arise first in the case of syllables which, not forming a complete word in the language, or forming a word that was difficult or cumbersome to express ideographically, could not be written otherwise. It is an intelligent device that the cuneiform users seem never to have taken, being content to the end to represent e.g. ah, ih, uh by a single symbol. As far as we know Proto-Indian would appear to have been the first script to adopt this device. It is not without interest to observe that Ethiopic and Brahmi have the same traits. With regard to the shape of \mathcal{V} , it probably represents a vase or jar with two handles, the upper horizontal elements representing the lips of the vase, the lower its handles. For the variety of its shapes and its Sumerian and Egyptian affinities see the Comparative Table.

With regard to the meaning of \mathcal{V} , at any rate of \mathcal{V} final, we may say that it is an affix. That it is an affix is suggested (1) by its normal position at the end of the text, (2) that it is preceded by well defined sign groups which there is reason to regard as complete words, either names of gods used in the formation of proper names, or titles, (3) that when it is found in the body of the text it is normally preceded by precisely the same combinations. That it is a

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1. The symmetry of Proto-Indian signs is one of the characteristics of the script. It is in harmony with the artistic sense of its users, so abundantly exemplified in their glyptic designs on these very seals. In the modification of signs this symmetrical principle was continued, each equal portion (whether $\frac{1}{2}$ or $\frac{1}{3}$) of the sign receiving the same modifying strokes. See Tables V, XV, XIII, XXIV, LXXV, LXXVI, CII, CVII.
 2. As often is the case with Sumerian gunu signs.

suffix which is not a determinative is probable for the following reasons: (1) If ∇ be a determinative its frequency indicates that it is one of a very wide class. 'Man' and 'scribe' are the only two that seem possible. But if it is either of these how do we account for its presence on the copper coins where we should expect rather the determinatives of king or ruler? If we reply that the determinative ∇ = man was probably used after all men's names whether rulers or not, then how do we explain the fact that a large number of typical square seals end in ∇ or ∇ which, as is shown in the analysis of Tables XV and LXVIII, stand in exactly the same relation to their antecedent words as ∇ does to its antecedent words? So that if ∇ is a determinative then they also are determinatives. No! If ∇ is a determinative after men's names, it is only one of several, and it would be difficult to account for its prevalence on the coins, in place of one of the more distinctive determinatives. While if we are right in deciphering one of these coins 'King of the land', ∇ would have to be regarded as a determinative either of 'king' or 'land', which in view of its prevalence on the seals, is impossible. So much for the negative evidence.

(2) That ∇ is a suffixed element in name-formation is strongly suggested by a comparison of Tables I and LXVIII. It will be seen that ∇ like ∇ is normally final. Like ∇ , if followed by any single sign, it is followed by ∇ , ∇ . Like ∇ it is preceded by well defined sign-groups that clearly constitute words. But, the three distinguishable words that precede ∇ , viz., ∇ , ∇ , ∇ , occurring as they do 26 times are never once found preceding ∇ , while of all the many sign-groups found regularly preceding ∇

not one is found preceding \uparrow . Are we to assume that all the men whose names ended in, say., Enlil, Nannar, -mansum, were leather workers, and all other men whatsoever were scribes?

For that is the position to which we are reduced if we insist on regarding \mathcal{V} and \uparrow as determinatives.

We must now consider the forms \mathcal{V} etc. Table I, Nos. 348-400, Col. IV. The first thing we notice is that these forms are never found at the end of a text. Secondly we note that they are often found with the same antecedents as \mathcal{V} . Compare Nos. 269-273 with 346-353, 375-6, 387; Nos. 49-65 with 354; Nos. 164-168 with 359. Nos. 243-245 with 360; No. 309 with 364; No. 321 with 365; No. 43-44 with 367-368; 330-331 with 369; 157-163 with 372, 376; 195-197 with 373, 398; 290 with 382; 138-149 with 392, 399; 215-217 with 400.

The example \mathcal{V}/\mathcal{J} , $\mathcal{V}^f/\mathcal{J}$, $\mathcal{V}^{wf}/\mathcal{J}$, $\mathcal{V}^{wf}/\mathcal{J}$ has this peculiarity: it is the one combination commonly found with \mathcal{V} in which \mathcal{V} is not final. In all the other combinations with \mathcal{V} , the \mathcal{V} is final in the totality or large majority of occurrences; with $/\mathcal{J}$ it is not once final, but on the contrary, in all five occurrences the combination is initial. But I doubt if this signifies anything more than that this combination is a name (of a deity?) that lent itself to employment as an initial element in the formation of proper names. When we find $\mathcal{V}^f/\mathcal{J}$ it is the same word with a change of vowel in the final syllable. In the case of this word \mathcal{V} would appear to have its normal use as a suffix, and consequently \mathcal{V}^f , \mathcal{V}^w , \mathcal{V}^{wf} also. But there is no reason to suppose that in their other¹ occurrences the \mathcal{V} group are other than the syllabic elements of roots. It is significant that the great majority of combinations commonly found preceding \mathcal{V} are not found preceding the \mathcal{V} group (i.e. the signs in the

¹ i.e. other than those on which a comparison with \mathcal{V} has been invited above

4th column of Table I, pp. 6 & 7). Thus both the form of the signs, which suggest deliberate differentiation from \mathcal{V} , and the circumstances of their occurrence combine to show that they are syllables allied to but not identical¹ with \mathcal{V} . Taking this evidence in conjunction with what has been observed concerning the modification of \mathcal{V} we may assume as a working hypothesis that both in the case of open and in the case of closed syllables signs were modified by the addition of short straight lines to represent syllables containing the same consonant but a different vowel.

We may now consider the function of certain signs that follow \mathcal{V} when the latter would otherwise be final. These are \mathcal{E} , \mathcal{X} , \mathcal{Y} , \mathcal{A} , \mathcal{B} and \mathcal{K} .

Now \mathcal{E} follows not only \mathcal{V} , but \mathcal{A} (which we have seen is functionally similar to \mathcal{V}) and a miscellaneous collection of signs (see Table LVIII). It is probably a suffix.

Allowing for the difference in the number of inscriptions as between Mohenjodard and Harappa this sign is proportionately seven times as frequent in Harappa, where it appears on 77 texts as against 20 at Mohenjodard. But these are mostly business receipts (see analysis Table LVIII). \mathcal{X} occurs twice after \mathcal{V} and four times after other signs. It is in every case final. It may be taken as a determinative. (See Table LXIV). \mathcal{Y} , \mathcal{A} in 9 out of its 10 occurrences (see Table XI) is final. It follows \mathcal{V} 3 times, and of its

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1. A further proof that they are not identical is that \mathcal{V} is found on one and the same seal in conjunction with other members of the group. It will be observed however that of the other members no two varieties are found on the same inscription suggesting that they are mere variants of each other, or phonetically interchangeable. This is further borne out by the presence of the same sequences with different members of the \mathcal{V} group, which are not found with \mathcal{V} . Cf. Nos. 361 and 381; 355 and 386; 357 and 390; 372 and 378.

other antecedents one is Δ . It may be taken as a determinative. Ξ is final in 6 out of 7 occurrences (see Table CIV). It follows ∇ 4 times, and ζ twice. It is probably a determinative.

\wedge when final is preceded by \bar{v} is three out of a total of 15. The proportion is so high as to suggest that it may stand in functional relationship to the \bar{v} as follows. It is perhaps the determinative of the first 'interval' (\bar{v}). That in point of grammar and syntax the combination of $\wedge \bar{v}$ appears to hold the same position as \bar{v} simple is suggested by the fact that, like \bar{v} , when final it is liable to be followed by the determinative suffixes \bar{e} and \bar{u} . (See Table III, 11, 14.)

As they are situated the condition of them is very bad. The first is a small one, not over 100 ft. long, and is very shallow, and is very much exposed to the wind. The second is a larger one, and is situated in a more sheltered position. The third is a very large one, and is situated in a very exposed position. The fourth is a very large one, and is situated in a very exposed position. The fifth is a very large one, and is situated in a very exposed position. The sixth is a very large one, and is situated in a very exposed position. The seventh is a very large one, and is situated in a very exposed position. The eighth is a very large one, and is situated in a very exposed position. The ninth is a very large one, and is situated in a very exposed position. The tenth is a very large one, and is situated in a very exposed position.

that $\mathcal{V} \mathcal{U} \mathcal{A} \mathcal{A}$ is a complete text¹; and LXX. 2,6,7 on the other hand, which shows that $\mathcal{A} \mathcal{O} \mathcal{A}$ is a complete text.

Table I, 41 compared with I, 39 and VII, 1, 49, 45, 48 and passim.

T. I. 51² compared with T. I, 50 and XI, 2, 19, 27, 38, 37, 39, 78, 97.

T. I, 139 compared with T. I, 138 and XI, 28, 46, 47.

T. I, 106 " " T. I, 103 and I, 206, 209.

T. I, 230 " " T. I, 122 and I, 200 and Table LXXXVI³.

T. I, 192 " " T. I, 191, 193, 194 and Table XII, 3, 2,)

T. I, 213 " " T. I, 212, 211 and T. I. 243-245. 4, 14. (

Other examples might be given, but these are sufficient to substantiate our contention.

In Nos. 339, 341-347 \mathcal{V} appears to be used simply as a syllable forming part of a word; in these cases it has probably no sense-connection with \mathcal{V} the suffix.

It remains to consider Nos. 4, 5 and 385 of Table I. If, as we have reason to believe, $\mathcal{V} \mathcal{V}$ and $\mathcal{V} \mathcal{U}$ are merely a spelling out of the same word (with a dialectal or euphonic modification of its pronunciation) which word when suffixed is usually written \mathcal{V} , it follows from Nos. 4 and 5 that the full word is a bi-syllable ak-ka (perhaps pronounced as though containing a single consonant). Now it has been urged that this word is a mere suffix. How then do we explain its appearance alone? A clue to the explanation is afforded

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1. On $\mathcal{A} \mathcal{A} = \mathcal{A} \mathcal{A}$ see analysis of Table XIII, and on the detachable nature of " and its antecedents see analysis of Table XXX.
 2. With regard to the short perpendicular stroke ' being a mere liaison semi-vowel, virtually equivalent to a point of punctuation see Table XXIX analysis.
 3. From which it will appear that $\mathcal{V} \mathcal{X}$ is a word in itself.

by No. 385, where V^f is found alone on each face of the prism (E. 77). While at Harappa I did not copy the design accompanying each of these V^f in the blank portion of the prism, as I did not at that time appreciate its importance; I made a record in my notes however that the design was a figure like that shown on K. 440, facing right on face (a), left on face (b), and the figure of a woman (?) facing right on face (c). In the case of No. 4 (M. 24) the design on the reverse of the coin was too effaced to be distinguishable, while regarding No. 5 (M. 500) I observed one horn and a portion of an animal whose identity I could not determine. Now it has been shown above that V^f and V^f are allied sounds, and that in the case of the word V^f) V^f } they are undoubtedly variant pronunciations of one and the same word. I suggest then that in $\text{V}^f \text{V}$, $\text{V}^f \text{V} = \text{V}^f$ and in V^f of Nos. 4, 5, and 385 respectively we have the final element (suffix) of the word V^f) , the) portion being represented pictorially by the divine or heroic figure. In other words V^f) is the name of the figure in E. 77 and K. 440. If this is so, as what sort of a suffix are we to regard V^f ? If the three seals are intended to give the owner's name, like all other seals, this name can hardly be Enlil-la-ge or Enlil-ge but only warid-enlil: or, to give a Hindu parallel which will be closer as preserving the order of the Proto-Indian, not Varayon-ke or Varayot-ke, but Varayan-Dees. In other words V^f final is a suffix not in the sense of a grammatical suffix but as a suffixed element, 'servant' or the like, used in the formation of proper names. The last 3 signs in Col. IV of Table VI are compounds.

are both closed syllables, as there is reason to believe (see analysis of Table XXIV) there can be no case of contraction or elision here. The compound will be either ideographic or integral (i.e. each syllable being pronounced fully as is the case with Sumerian compound phonograms.) The two preceding signs are probably phonetic compounds of the integral sort. The compound is resolved in text No. 5. The reason for writing integral syllables as a compound is probably the same as in Sumerian: viz., that they form one word.





Analysis of Table II.

The similarity of the form of the signs in Col. IV suggests that they may be variants or represent allied sounds. That they are not all variants is clear from No. 22, where U and U^u appears on the same text. But that U is closely allied to U in sound and can take its place, is clear from a comparison of Nos. 15 and 18. It is interesting to compare U with V^f. For just as V^f is clearly a member of the V^f group (cf. I. 401 with I. 391 and I. 51, 139. 331, 357) and probably a graphic variant of V^f; so U clearly belongs to the U group and is probably a graphic variant for U, which is not found on these texts (perhaps to avoid confusion with U which is ideographically quite distinct). Again a comparison of Nos. 24 and 25 shows that U^u and U are variants, which again is parallel in the V^f group. The sequences in Table II give no direct evidence as to the value of U, but the analogy of the V^f group suggests that U should be regarded as phonetically allied to U and U. There is nothing repugnant to this in the sequences, while the morphography of the sign strongly supports



such a view. We may conclude therefore that U is a syllable. That the remainder are graphic variants of a sign which was formed by a deliberate modification of U to represent an allied syllable.

The last two signs in Col. IV are variants of each other. The sign is a compound of U and Y .







Analysis of Table III.

Really no evidence on which to form an opinion. The similarity of shape suggests that the two signs in Col. IV are identical. If it is phonetic its rarity is a matter for surprise, unless it be a compound. It may possibly be a compound of U and  (see Table CIII). It is seen from  and  that U and  are found elsewhere as compounds. (See Tables II and XXVI).




Analysis of Table IV.



That the first two signs in Col. IV are simple variants is suggested by a comparison of Nos. 1 & 2. That the 3rd and 4th signs are also variants is virtually certain from their shape. That the 6th and 7th are either variants of the above or at least allied is implied by the sequences of Nos. 5, 6, 7. That the 10th sign is a variant of the 5th and 6th is suggested by the sequence   . The 8th and 9th are clearly variants of each other. The last sign has a sequence in common with the 6th. Regarding the 7th we can only note its shape and its initial position in favour of regarding it as a variant of the group 5-11 (cf. Col. IV). On the analogy of Tables I, II and VI we may accept this group as variants. On the same analogy we should be inclined to treat group 1-4 not as a variant of group 5-11 but as an allied syllable, or gunu variety.

Analysis of Table V.




The principle reason for including the signs in Col. IV under one Table is their shape. With regard to the 2nd and 3rd we have also the community of the suffixed . The similarity of shape between these two signs is also most marked. The additional stroke in the second of them recalls the addition of strokes to the base form of the sign in Tables I, II, IV, VI, and suggests that here also we have the modification of a sign to serve as the symbol of an allied sound. The 4th sign in Col. IV is sufficiently like the 2nd and 3rd signs, and sufficiently unlike any other sign in our texts to warrant its inclusion in the Table. We may take it provisionally then as a simple variant of the 2nd sign.¹ The inclusion of the first sign  has less to support it as regards shape, and the sign would not have been included at all but for the fact that it is preceded by, . This sign belongs to a comparatively rare group (Table LXXI) and the fact that it is twice found preceding  suggested the possibility that  (which was otherwise unconnectable with any sign) might be a later and simplified or cursive form of .

Analysis of Table VII.


It is clear from the sequences that the signs in Col. IV of this Table are simple variants, except the last three. With regard to the sign , we may compare No. 63 with Nos. 26, 27; No. 64 with No. 38; No. 65 with No. 58 (there is reason to think that  is phonetically allied to , see analysis of Table XLIII) No. 66 with No. 55. But the similarity of

1. Or as a gunu variant, from intermediary forms  


sequences is not very close. In particular it is to be noted that this sign is not followed by ||| , and does not appear as initial or quasi-initial, whereas U , U are normally initial or quasi-initial (i.e. preceded by signs which are either whole words or prefixes. It will be shown later that all the members of the fish group, and X are in the nature of prefixes). The sign is then related to, but not identical with, U (of which U is a less complete and probably later form). Now it will be observed that graphically the respect in which U differs from U is precisely in the addition of two short strokes. In view of what has been said in the analysis of the previous tables we may safely assume that here also we have a case of a syllabic sign being modified to represent a phonetically cognate syllable. We shall also on the same grounds take the penultimate sign in Col. IV as a simple variant of U . . Of course the variation may be of the gunu order and the syllable still be phonetically allied. The last sign may be a phonetic compound in view of its shape and the fact that it is initial. For if U be the initial part of the compound we should expect to find it initial in the text, as U is frequently initial or quasi-initial. That U is the initial part of the compound we may assume, partly because it appears above the other portion, and partly on the analogy of Brahmi and its derivative Nageri which place the second element in a compound either after or below the first part, (an example of the second part placed after the first has already been noticed in Proto-Indiar in the compound U). On the other hand if we take our sign as a compound it is difficult to identify the second element. Is it X ? (see T. LVIII. Col. IV. last two signs). This seems the most probable explanation. If we regard it not as a compound but as a single sign it is to be observed that there

is no sign in Sumerian or Egyptian with which it may be compared. There is of course the sign given as No. T. 24 page 500 of Gardiner's Egyptian Grammar, but this does not contain the element  which would appear to be an essential part of the sign. I shall assume therefore provisionally that the sign is a compound of  and  .¹

Analysis of Table VIII.


The sign in Col. IV appears to be distinct. Morphographically its nearest neighbour is  . But an examination of the sequences in Tables VIII and XV make it appear most unlikely that this resemblance is other than coincidental.

Analysis of Table IX.

It is morphographically improbable that the two signs in Col. IV are other than simple variants. Again there is nothing to connect them with any other sign. If their sequences showed any striking resemblance to the  group (which like this group seems to represent a plant of sorts) one might admit the possibility of a causal connective; but they do not.

Analysis of Table X.

The signs in Col. IV are clearly all variants. They differ only as regards the shape of the enclosed element, and the varieties of this are precisely the same as the varieties of that element when it appears alone (see Table XI) where it can be shown that they are all variants (see analysis of Table XI). That the various signs in Col. IV of Table X are all variants is also evident from the sequences.

alternatively it may be explained as  modified by the vowel ū.

With regard to the function of this sign, we shall observe that (a) it is frequently initial, (b) it is never final, (c) it normally precedes signs that can be shown to be prefixes (like the fish-group) or sign-groups that are in themselves whole words; e.g. in Nos. 9, 11, 34-36, 39, 46, 50. It is clearly then frequently a prefix¹, probably in every case except Nos. 41-45, when it appears to be the second element in the word @P






With regard to the fact that @ is never found final while '@' is so found and the inferences to be drawn therefrom, see analysis of Table XXXI. It has been noted that this sign contains two elements O and Y, which elements are also found independent in our script. (See Tables XI and XXVI). Are we then to consider it as a compound phonogram? In this case it must be either Y-O or O-Y. Now if it is Y-O it is strange that it is never final. If it is O-Y it is strange that it is never preceded by one of the numeral signs which so commonly precede Y. I conclude that it is not a compound phonogram but (in origin) a compound ideogram as in Sumerian. (See Appendix II p. b No. 99). The sign then represents a garden - a tree in an enclosure.² It is not likely however that it retained this sense in our texts. It is difficult to see how a garden or cattlepen could be utilised as a prefixed element in the formation of proper names, and a very common element withal. No! In our texts it is doubtless used as a simple phonogram, homophonous no doubt with the original ideogrammatic value, or an abbreviation of the latter, but unconnected with it in




1. By prefix is always to be understood "prefixed element in the system of name-formation" unless otherwise indicated.

2. The motif of the Sumerian parallel is however different. A closer approximation in motif is the Sumerian sign No. 20, p. 1. This means 'cattlepen' which may be the original ideographic meaning of the Proto-Indian sign also.

meaning. This feature probably holds good of the large majority of the signs in our texts. They were doubtless all formerly used ideographically, either in Proto-Indian or in the scripts where they originated, but have by the period of our Texts come to be used as mere phonograms. Whether when borrowed (in the case of those that bear evidence of borrowing) they were borrowed as ideograms or phonograms, must be decided in each case on the evidence of the comparative Tables. Where a Proto-Indian sign can be identified both with an Egyptian or Sumerian sign and with a sign in Cypriote, Brahmi, or Sabaeen, and the phonetic values of the former and latter coincide, we may infer that Proto-Indian borrowed the sign as a phonogram. When this is not the case we may infer that the Proto-Indians borrowed the sign as an ideogram, utilised it to represent a word in their own tongue of the same meaning, but of course phonetically different, and passed it on with their own phonetic value, which would be quite independent of its phonetic value in the script of origin.

Analysis of Table XI.

It is clear from the sequences that all the signs in Col. IV except the last two are variants. The characteristics of this sign are (1) that it is normally final or quasi-final, (2) that it is normally preceded either by a numeral sign or by . On the significance of the numeral signs see Analysis of Table XXXI. The sign is presumably a tree. It has two characteristic forms  ,  wherein the position of the branches relative to the trunk (or stem, if we consider it a plant rather than a tree) is symmetrical, and  ,  where it is not. This difference in morphography is marked, and

seems to refer back to the (probable) Proto-Elamitic origin of the sign.¹ If we examine Del. au Perse XVII. Pl. III, No. 17, we shall see three kinds of tree or plant. Two of them have the upper portion thus , and are differentiated only by the number and position of their lower leaves or branches. They are evidently varieties of the same species², since in the total they are enumerated together. The third kind has the upper portion symmetrical thus , and is enumerated separately. It is virtually certain that the two species had separate names in Proto-Elamite. Yet their forms in Proto-Indian serve clearly to represent one single word:- are simple graphic variants. The most probable explanation is that the signs were taken over into Proto-Indian as ideograms: that in the Indus valley people did not, in the spoken tongue, differentiate between the two species of plant, and therefore did not differentiate in their script, but used the two signs indiscriminately to represent the word which, for them, covered the two species. From this it follows that at least one, probably many, and possibly all of the Proto-Indian signs borrowed or descended from Proto-Elamite, or collaterally descended with Proto-Elamite from a common ancestor, had at the moment of their borrowing, descent, or severance (according to the hypothesis we adopt) ideographic rather than phonetic import, and were on their first appearance in Proto-Indian ideograms and not phonograms. With regard to the last signs in Col. IV, they are clearly variants of one another since they differ only in the curvature of the  element. But they are clearly not variants of the remainder of the group, since (a) the sequences found with the remainder












1. The Proto-Elamitic origin is strongly suggested by the fact that the varieties of this sign in Col. IV are precisely the varieties of the sign (signs ?) in Proto-Elamitic. See the Comparative Table.







2. Op. cit. p. 3.

Analysis of Table XII.












The sequences show that all the signs in Col. IV are simple variants. The sign is always final except in No. 20. It is clearly not a general suffix but the second element in a word, except in Nos. 17-20 where it may be an independent word in itself. The internal strokes are of the gunu order and do not affect the phonetic value.





Analysis of Table XIII.

That the first two signs in Col. IV are identical with the third sign is suggested by a comparison of text 1 with 8, 88-92; and 2 with 3-22. They are probably late and simplified forms of . With regard to , the form itself and its Sumerian and Egyptian resembling forms, suggest a fish. With regard to its function we may note first that it appears to be the second element in certain words, notably  ,  . Secondly we shall note that in a large number of contexts it appears to be a prefix, appearing either as initial, 66, 78, 86, 89, 96, 97, 101, 102, 112, or quasi-initial after other prefixes or whole words, 23, 33, 34, 41, 90-95, 99, 100; and usually followed by sign groups which are whole words: 23, 25, 64, 77-79, 88-94, or by the signs which are commonly suffixed;  passim,  61-63,  86, 87. From this it is clear that  frequently appears as a word complete in itself which is often used before proper names, see especially H. 145 and M. 209 where the words which follow  in 88 and 94 respectively are found as complete texts.

 unlike  does not appear to be intimately connected with any sign, as  is with  and . But apart from this it is surprisingly like . Almost

variant of the word which could equally be written with any member of the fish group.

To  may be applied all that has been said regarding  in the matter of function¹ and phonetic value. It appears to be a modification of  by the addition of . It figures as prefix to the group   to the exclusion of every other member of the fish group. Again it constantly appears on the same texts as other members. Thus its individuality is clearly established. At the same time its shape, position, and contexts leave no doubt regarding its close alliance both in meaning and sound with the other members. We thus conclude that , , , , , are all distinct, yet are all used to write one and the same word. In what then does the variability of this word consist? Certainly not in ideography. A scribe might, as in Sumerian, occasionally represent the same word by different ideograms, but he could not do it on principle; nor will an ideographic explanation account for the marked preference for particular forms in particular contexts. We are driven to admit that the variation is phonetic. Again this variation is not on grounds of euphony. The sequences show continually different varieties of the 'fish' sign between identical antecedents and sequents. The most striking illustration of this is afforded by Table XII. The variation must then be dialectal - varying from speaker to speaker, or village to village, or period to period. The next point to consider is the frequency with which two varieties of the fish sign occur together. In all these cases¹ the signs and sequences preceding or following the two fishes can be shown to be independent words. The two fishes may be assumed then to constitute a single word in every

1. Excluding the combination   and   which have been shown to be separate words.

case. The question is whether all the combinations represent one and the same word with dialectal phonetic variations, or whether each variety of combination represents a different word. We should incline to the latter opinion, were it not for certain remarkable uniformities, viz:- (1)

$\hat{X}\hat{X}$	occurs	4	times	$\hat{X}\hat{X}$	occurs	3	times
$\hat{X}\hat{X}$	"	3	"	$\hat{X}\hat{X}$	"	2	"
$\hat{X}\hat{X}$	"	3	"	$\hat{X}\hat{X}$	"	3	"
$\hat{X}\hat{X}$	"	2	"				
$\hat{X}\hat{X}$	"	5	"				
$\hat{X}\hat{X}$	"	7	"				
$\hat{X}\hat{X}$	"	2	"				

no other varieties of
the combination are found.

It is curious if all these words are different that they should occur roughly the same number of times.

(2) It is curious if they are different words that they should occur so often in the same positions in the text, suggesting that their function in name formation is similar.

(3) It is strangest of all that they should be found in the same sequences. See especially M. 235 with H. 238; M. 318, 317, 485 with M. 139 and M. 507 and M. 453; M. 395 with M. 388 and H. 136 and I 26; M. 318 with M. 260, 344 and M. 238; M. 183 with H. 113 and M. 475; M. 104 with H. 179, M. 501; M. 54, 317 with H. 179; M. 490 with M. 335 and M. 54.

(4) It is also curious that each variety of the modified fish should appear in these compounds roughly in same number of times in proportion to its total appearances. Thus

\hat{X}	appears in these double fish compounds	7	times	in a total of	19	occurrences.
\hat{X}	" " " " " "	17	"	in a total of	47	occurrences.
\hat{X}	" " " " " "	18	"	in a total of	66	occurrences.
\hat{X}	" " " " " "	19	"	in a total of	64	occurrences.



I.e. in each case the proportion is roughly $\frac{1}{3}$.



I think then that the evidence is cumulative and forces us to the conclusion that in all these varieties of the 'double-fish' group we have but one word with varieties of pronunciation that are dialectal or euphonic or both.

We now note another peculiarity. This double-fish word which like the single-fish word shows wide dialectal variations is found in the same relative position in the texts and in the same sequences as the single-fish word. This is best illustrated by Table XII, where we see the word 𐎧𐎫 preceded 3 times by the double-fish word and 6 times by the single-fish word. And every time the fish or double-fish is initial (or quasi-initial). Similarly we find 𐎧 suffixed to the single-fish word 16, to the double 6 times; compare also the occurrences of the two words with 𐎧𐎫, 𐎧𐎫𐎧𐎫. In fact among the 33 signs which are found immediately before or after the double-fish word the only ones that are not found in the same relation with the single-fish word are 𐎧, 𐎧, 𐎧, 𐎧, 𐎧 and 𐎧. The remainder are not only found, but found repeatedly. The evidence then is very strong that the single-fish word and double-fish word are identical. In fact the latter may be regarded as a spelling out of the former. We have then the following ways of writing this word, the phonetic relationship of which I have endeavoured to suggest by transliteration. The consonant 'b' is of course selected arbitrarily; the allocation of the given vowels to any particular variety of 'fish' is believed to be exact, for reasons that will be discussed later.





It will be observed that the same two varieties of fish are never found together in our Texts. This would seem to suggest that when the Proto-Indian formed a carative or a 'jangle' by the reduplication of the root, he avoided repeating the same vowel. The same tendency is observable in many languages, cf. English 'baby', French bébé, Italian 'bambino'.

It is also clear, if our inferences are correct, that at least some of the signs in our script stand for syllables that are closed at both ends consonant-vowel-consonant:- what have been called 'compound syllables'.




Is it possible from our texts to discover the meaning of this word which in one or other of its varieties occurs hundreds of times? We may note first of all that no member of the fish group is ever found final except ¹, and that only in sequences where it may well form the second element in a word. Nos. 81, 84, 85. Secondly the fish word is often found initial or quasi-initial. Thirdly it sometimes separates two sign groups which are clearly words, and probably names, in themselves, e.g., Nos. 73, 128, 156, 162, 166, 168, 209, 210, 211, 235, 245, 284, 285, 255, 257, 258. To these may be added all those cases where the fish word is preceded by a sequence ending in " . But these sequences although probably complete words are often not names of men but rather in the nature of a dedicatory formula (see analysis of Table XXA). Be that as it may these three considerations lead me to the conclusion that the fish-word may very possibly be the Proto-Indian word for 'son'. In this case the word 'son' comes before the name of the father as in Sumerian and Auzanite. It is worthy of note that where a modified form of  precedes a member of the fish group, the nature of the modification, whether by one, two, or three strokes, seems to depend on the variety of the




1. And  in No. 297: where also it is probably an element in a word, as  is nowhere else followed by any 'fish' sign.








fish sign or vice versa. See Nos. 128, 156, 209-211; 266, 285, 286. We have seen that the varieties of the fish sign are phonetic varieties, and that ∇ etc. are phonetic modifications of ∇ . May we now assume that the number of strokes by which the ∇ is modified is not immaterial but indicates different phonetic varieties? If so it would appear that the law of vowel harmony was rigorously observed in Proto-Indian speech¹ and meticulously recorded in the script. This has its parallel in Sumerian also. On the whole I think we cannot reject the evidence of these concomitant variations and must assume that ∇ , ∇ , ∇ represent $k\bar{i}$, $k\bar{i}$, kui respectively.²

 The last sign in Col. IV is possibly a graphic variant of  via a lost intermediate form . It will be observed that the variety of preceding ∇ is ∇ . Or it may be an independent sign. It may be connected with  (see Table XIV).


Analysis of Table XIV.


In view of the fact that  and  are clearly modifications of ∇ and  respectively we should expect




1. At least in the case of the liquid vowels. The simple form ∇ which is probably articulated with a (inherent in the base form of Brahmi and Ethiopic) seems more stable, being found before , , and , and after all sorts of signs (see Table I). It is perhaps worth remarking here that if (as I think it is arguable) the Brahmi, Sabaean and Ethiopic scripts are all derived from Proto-Indian, and if the Ethiopians were allied in race to the Ethiopic Gedrosians (?) of the Indus valley, then the extraordinary fluidity in the Ethiopic liquid vowels, may have its explanation in the similar fluidity of these vowels in the Proto-Indian parent. By this I do not wish to suggest linguistic descent, but merely that if there was racial descent or affinity we may expect the phonetic peculiarities of the parent (which are determined by the physical conformation of the organs of speech) to be manifest in the descendant even when speaking a different tongue.
2. See analysis of Tables XXIX and XXXVIII.








to find a form  as the base form of the sign in Col. IV. It is not however found. It almost certainly existed. Perhaps it dropped out, as many of the Sumerian signs of the Jemdet Nass period dropped out, its place being taken by another symbol with the same phonetic value. It is not improbable that in  (see above) we have a modification of this lost base-form.¹ For it is significant that  is preceded by a solitary  and forms part of a word ending with " . Neither of these features can be found with any other modified form of  . It is probable then that it is not a modified form of  which leaves the way clear for considering it a modification of  . That is all we can say at present.



Analysis of Table XV.

All the signs in Col. IV are either variants or allied. This is indicated (a) by the shape (b) by the position, nearly always final, (c) by the sequences R| Nos. 3-6, 15, 37, 38; and R  , Nos. 2, 28, 29, 43-48. These may be regarded as the key sequences of this Table. They will help us to decide whether the various signs in Col. IV are simple variants or allied only.


On morphographic grounds we may divide the signs in Col. IV into two groups; the first eight, ending with Text No. 20: and the last seven, Texts No. 22 to 52, 21 is of course indeterminate. Now it will be observed that while the sequence R| occurs five times in the first group, it occurs twice only with the second, and while the sequence R  occurs once only with the first group it occurs 8 times with the second.

Again R  and R  occur twice, R  thrice with the second

1. For the graphic nature of the modification  , 
cf.  ,  ,  ,  .
(Table V).  (Tables LIII, XCVI).










group and not at all with the first. Conversely $\text{RY} \square$ appears twice with the first group and not with the second. We may infer then that the two groups represent two sounds allied but not identical. It will be noticed that the respect in which they differ is the addition of short strokes. In view of what we have seen in the analysis of the previous Tables, we may be certain that this indicates a modification of the vowel of the syllable. The shape of the sign in No. 22 is peculiar. The vertical foundations or base for the horizontal strokes has been drawn, but the strokes themselves omitted. This is probably an error on the scribe's part or my own in copying.¹ The additional element may be compared with the same in the signs  ,  . It probably indicates that the syllable is to be articulated with the vowel \bar{u} .


Analysis of Table XVI.

From the evidence of their shape and sequences there can be no doubt that the 2nd, 4th and 5th signs in Col. IV are identical. Again the evidence of the sequence $\bar{V} \text{X} \text{R}$ is so powerful that we must conclude that the third sign T which has no neighbour in shape among the other signs of the Proto-Indian script, is an abbreviated or simplified, probably later form of  This view is strengthened by the shape of the last sign in the text (No. 12) which, as we have urged in the analysis of Table I, must be regarded as a late form of the sign \bar{V} . It is interesting to observe that both these

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1. It is to be regretted that in the case of the majority of the inscriptions I have had no opportunity of checking my autograph copies with photographs of seal impressions. I requested that such photographs might be supplied to me by the Archaeological Department of the Government of India, but up to the present they have not been received.

late forms approximate to the shape of the corresponding signs in Brahmi. (See comparative Morphographic Table).



With regard to the first sign in Col. IV the evidence of the sequences is negative, and this sign is probably independent. As it occurs only once it may well be an ideogram rather than a phonogram. The sign in text 41 may not be a sign at all but a decorative device. On the other hand it may be the fuller and more complete form of . As it occurs alone there is no help to be derived from the evidence of sequences. If it is a sign, it is probably an early form of . The shape of this sign  and its variants ,  is exactly paralleled in Sumerian and Proto-Elamitic; and in those scripts also we have no morphographic clue as to its original ideographic significance. It is hardly likely to be a man's hand, as we already know the sign for this in Sumerian, and it was quite distinct from . It is possible that  is a compound of  + . The fact that the sign appears in the upper right-hand corner of the seal (which below contains the design of a many-headed beast) makes it probable that it is to be regarded as script and not a decorative device.²


The signs in Col. IV that accompany Text 5 Nos. 42-48 are clearly a doubled form of . They are simple variants of one another. Their significance is argued in the discussion on Plurals p. 74.

Analysis of Table XVII.



The shape of the first three signs in Col. IV and the evidence of the sequences makes it reasonably certain that

1. See Miscellaneous Table, C 11.

2. On the whole, combining the evidence of Plate I N° 18, the signs ,  (J. ELIX) and this table, I opine that the sign represents a table of offerings, and is of Egyptian origin. It will follow as a corollary that the Sumerian and Proto-Elamitic forms are Egyptian origin also.

these signs are simple variants of one another. The first is probably nearest to the original pictogram which doubtless portrayed a marsh,¹ (cf. our own conventional way of indicating a marsh in map-drawing ). The key sequence in this Table is $\Delta W R$

Analysis of Table XVIII.



The sign in Col. IV seems to be independent. Its only near neighbours in shape are  and . The resemblance is not really close in either case, while the evidence of any connection in the sequences is distinctly negative.


Analysis of Table XIX.

The two signs in Col. IV, opposite texts 23, 24, are perhaps independent signs; but perhaps allied, since there is a resemblance in shape though not in sequences. The remaining signs in Col. IV of the whole Table are undoubtedly simple variants. The form in text No. 8 should be regarded as original, showing the tail, back, two ears and hind legs of an animal. The shape of the ears suggests the jackal. The ears seem to have undergone progressive conventionalisation and suppression until in text No. 14 they disappear entirely. We may compare the same phenomenon in Table LIX.




Analysis of Table XX.





The first two signs in Col. IV may be taken as variants in view of their virtual identity in shape. They do not appear

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1. The portion  is probably the bulbous root of the marsh plant - indicates the ground line and  the visible portion. Alternatively, the sign may be borrowed from the Egyptian sign for a papyrus clump.

to be connected with the signs in any other Table. The stroke ' makes one suspect that the base form is . The first two signs will then be the base form modified by the vowel ū, the third sign will be the same modified by the vowel o.

Analysis of Table XXI.

The first and third signs in Col. IV may be taken as identical. The second sign is shown to be a mere graphic variant by its place in the sequence    which is the key sequence of the Table. It is interesting as approximating exactly to the Sabaean form, and may therefore be regarded as the ultimate form of the sign in Proto-Indian.

The signs in texts 43-54 differ from  only in the number of interior lines, and may therefore be regarded as allied. If No. 42 is correctly copied this inference would be also supported by the sequence  . But the signs on the coins are so faint that it is possible that the sign in No. 42 may also have contained the interior lines. From the evidence of the sequences, notably the absence of the key sequence it is certain that the signs with interior lines are not mere graphic variants of . It is not likely that this modification by interior lines corresponds to the phonetic modification that we have observed in the case of signs modified by the addition of short strokes, firstly because in this case the strokes are not short, and secondly because in the case of text 46 their number is too great. The modification appears to be rather analogous to the modification of Sumerian signs to form gunu signs. In the latter case the number of added strokes is immaterial. We may infer the same here.

The last sign in Col. IV is probably an independent sign.

Analysis of Table XXII.

The sign in Col. IV appears to be independent both of those in Table XXI and those in Table XXIII. It may possibly however be allied to the last sign in Table XXI.

Analysis of Table XXIII.

The key sequence $\Delta\Delta R$ shows that all the signs in Col. IV are simple variants. The most complete and probably earliest form is the last, Text No. 8.

Analysis of Table XXIV.

Both the shape and position of \diamond and \emptyset in the texts and the fact that each is normally followed by " leads us to infer that they are graphic variants of one and the same sign. The forms of this sign appearing in Nos. 47, 48 are probably defective. It is not likely that they are other than variants. Cf. 46 with all the texts containing " \emptyset " and also with No. 1; 47 with 61; in the case of 49 the three interior strokes were lightly incised on the original and may have been accidental scratches.

No. 50 would appear to be a modification of \diamond by prolonging the element \vee to provide a base for adding short strokes at right angles. Compare the modification of the base form in Table XV.

The sign \emptyset is probably pictographically independent¹. It is perhaps an ideogram for 'heaven'; the circle representing the sky and the interior lines a star. Or it may be a wheel. Functionally it resembles \emptyset, \diamond . It is not likely however

1. It is certainly not identical with \emptyset, \diamond since it occurs on the same Text, M. 139, whereas \emptyset, \diamond are never found on the same Text.


that it is phonetically allied. At least no such conclusion could be based on any assumption of euphonic variation, since like O , ◇ it is initial, and like them followed by " It is probably then quite unconnected, like V and ↑ which also seem functionally to correspond. We must now endeavour to ascertain this function since so many of our texts begin with " O ", " ◇ ", " ⊗ ". Now it will appear from an analysis of the sequences Nos. 8-43, 46, 51-61, 102, 104-127, that " marks a halt in the sense. What follows is quite independent of what precedes, and constitutes a complete word or words in every case; words which are sometimes found as complete texts in themselves; while no less than fifty are found as initial in other texts. If we turn to the analysis of Table XXX we shall find that there also what follows " is invariably a name complete in itself.

" O etc. is therefore not a prefixed element in certain proper names but an element unconnected with proper names yet regularly placed before proper names on seals. What sort of an element is this? If we may be guided by the Babylonian analogy we may assume that this element was a dedicatory formula. "To the god X." Compare also the Herat seal, geographically so near to the site of the Proto-Indian civilisation. (Antiquity 1927. p. 206). O and ⊗ may then provisionally be assumed to be names of deities and " the dative suffix. When we have several signs before " we may have as well as divine names some phrase like 'for his life'. Now it will be observed that " ⊗ ", " O ", " V " appear in the same position in the texts; that the first occurs 24 times, the second 10 times, the third 7 times. Furthermore a comparison of Nos. 104 and 128; 107 and 129; 105 and 136; 106 and 138; etc. shows that the selection of any one of the three was not made on grounds of euphonic harmony with the following word. I conclude that the dative suffix was a word

subject to phonetic variation. That its normal value was " and that this value was invariable after syllables whose vowel was a, such as ①, ② but was variable after a syllable containing a liquid vowel, as, I suggest, was the case with ③. The suffix would still normally be " which I will take to have the value ī, but might be ' (which we will assume to be the vowel ī) or / (which we will assume to be the vowel ī pronounced with a labial glide - u^l or w^l). Let ④ = AN. Let ⑤ = BIL. Then 'To AN' is always AN-ī. 'To BIL' is normally BIL-ī, but optionally BIL-ī and BIL-ū. The use of / as a dative suffix does not appear to be confined to / ④ : see analysis of Table XL. The reason for taking " , ' , / to be simple vowel sounds is based on an analysis of Table XXIX, which show ' to be the vowel ī or u, and probably the former, taken in conjunction with the evidence already noted of ' and " representing vowel modifications when inserted in ū and elsewhere. If ' is a vowel there is strong reason to believe that " is also a vowel. And if ' and " which can both stand as the dative suffix, are vowels, there is reason to suppose that / which is also a form of the dative suffix, is also a vowel.

We have now to consider Nos. 5-7, 93-97, 146-148. In these cases ⑥, ⑦, ⑧ are initial and there is no ground for assuming that their function is other than when followed by " . What then has become of the dative suffix? I take it that in these cases the sign following ⑥, ⑦, ⑧ began with a vowel, and that in consequence the dative suffix was absorbed or elided; in other words that ⑨, ⑩, ⑪, ⑫ are closed syllables. In the case of ⑬ this can be demonstrated (See analysis of Table XXIX).









The last two signs of Col. IV are clearly compounds of ⑭ and ⑮ and variants of one another. The form ⑯ as





simplification of  is not perhaps surprising, but it is interesting as giving us an exact approximation to the Phoenician.

















Analysis of Table XXV.

The resemblance between the two signs is probably deceptive as there is marked dissimilarity in the sequences except in the solitary case of the sequence R H (Nos. 6 and 7).

Analysis of Table XXVI.

Although  is a variant of ,  does not appear to have any connection with , their sequences being entirely different. This is not necessarily a matter of surprise, as there is no reason to assume that  and , or  and  were in any way connected as to their pictographic origin (see pictographic Table). And we have noted above how the similarity between the designs of the signs in Col. IV of Table XXV is purely coincidental.

The sign  would seem to be connected with  in view of the occurrence of the sequence E D R which is found nowhere else. In that case we may probably assume that the groups in Col. IV Texts 20-24 are modifications of  by the addition of strokes corresponding to a modification of the vowel of the syllable to ē. The group appearing in texts 34-38 may be the compound B . The sign in Col. IV against Nos. 40-41 is probably of independent pictorial origin.

 may be  + ;  may be  +  (cf. Table LXIV ).  is clearly  + ;  is  + . With regard to the signs in Nos. 47-56  is almost certainly equal to  which makes us suspect that in this form of bracket we have really a splitting of the sign  to make room



for enclosing a sign with which \bigcirc is to be compounded. In the case of Nos. 54, 55, the compounds would appear to be 'integral' (i.e. each syllable pronounced fully without elision or contraction).

The signs \bigcirc and $()$ are then identical. We may therefore assume that \bigcirc , \bigcirc^f and $()^f$ are also identical. The fact that \bigcirc^f is like \bigcirc liable to be compounded with an inserted 'fish' suggests that it is a phonetically allied syllable, and that in (\bigcirc^f) , $(\bigcirc^f)^f$ we have really one word \bigcirc^f differently pronounced. The fact that \bigcirc is found with the same modifying element f as is found with \bigcirc , makes us suspect that \bigcirc and \bigcirc are allied syllables. And from what will be said concerning f in the analysis of Table XXIX together with what we have already said about it we may infer that \bigcirc is \bigcirc with the substitution of \check{i} for \check{a} as its vowel element.

I would then conclude that the form \bigcirc is original $\cdot ind$, that \bigcirc is the syllable articulated with \check{i} , \bigcirc with \bar{e} , \diamond is quite independent of \bigcirc \diamond is \diamond articulated with \check{u} , \diamond is the same articulated with \bar{u} .



f is a modifying phonetic element, not a mere variant. This is clear from text b^o, where in both \bigcirc and \bigcirc^f appear. This element is also found with \gg . It is not to be confused, phonetically at least, with the element similar in shape in the signs \bigcirc^f , \bigcirc^f . These signs are animate signs, and the element f is in them pictographic, indicating an ear, while \bigcirc^f probably indicates the jaw. Being merely pictographic their presence or absence is immaterial to the ideogram which consequently shows much variety, appearing either with 2 ears, 1 ear, 2 jaws, 1 jaw, 1 ear + 1 jaw - or nothing! See tables LIX and XIX.

Analysis of Table XXVIII.

Probably variants. The first sign is obviously the second reversed. But it is unlikely that that alters its significance, as throughout these texts reversed and normal forms of signs seem to be identical. See Tables of   (LVIII, LXXIV, LXXXIV).

Analysis of Table XXIX.

It will be noted that the sign ' sometimes occurs at the top of the line, sometimes towards the middle. But it is clear from the sequences that this is immaterial. The same is true of " (Table XXX) and many of the signs in Table XXXI. It will next be observed that this sign is often found between sign groups that are whole words and even whole names, the elements before and after ' being found as complete texts. Cf. No. 23 with M. 286 and M. 184; No. 26 with M. 297, 298 and H. 148, M. 209.

Now what sort of an element is this which serves to link together (or separate) words, names, and even texts. Our first answer would be that it is a mark of punctuation as in Phoenician, and comparable to the Virama in the later Indian scripts. But the evidence of Nos. 10, 31 and 19 is against this explanation. Here ' is final. If we assume that here also it is a mark of punctuation used to indicate the termination of a text, how do we account for the fact that only three texts out of over 750 are so terminated? It seems certain that in these texts it has a phonetic value. But if in these, then also in all the other texts where  or  are found. Are we then to conclude that ' had two distinct values, the one phonetic and the other punctuative? In view of the ambiguity that this would introduce into the script, and the fact that elsewhere the script provides so

scrupulously for the exact rendering of phonetic values (e.g. \bar{v} \bar{v}^h \bar{v}^w \bar{v}^f) this would appear most unlikely, and we should only be driven to such a conclusion as the last resort. A far more probable explanation would be to regard \bar{v} as the vowel \bar{a} or \bar{u} , which when placed after a word ending in and before a word beginning in a vowel serves to break the hiatus, and is pronounced as the semivowel y or w . In this connection it may be pertinent to recall the principle obtaining in certain of the Hindi languages of avoiding a hiatus by the insertion of a semivowel. The Hindi group is probably the oldest group of languages in India, and there are evidences of it in Brahui, which speech today covers part of the area of the Proto-Indian split. In favour of regarding \bar{v} as a simple vowel there is also the analogy of \bar{v}^h , and the other signs noticed in the analysis of earlier tables, where the addition of the stroke \bar{v}^h represents a modification of the vowel of the syllable. Again it is significant that of the cases where \bar{v} may be taken as bridging a hiatus between words; nos. 5, 7, 22, 23, 28, 31, \bar{v} is preceded by \bar{v}^h or \bar{v}^f , which we know to be an \bar{a} or \bar{u} .



two words; and it is possible that this may have been the origin of the later Phoenician device of indicating the separation of words by a vertical stroke, ' .

Now is it possible to determine which of the vowels i (y) and u (w) ' represents? I think it is.

If we examine the Brahmi of the Asoka inscriptions we shall observe that the vowels in composition are written¹

$$R' = \text{Ī}; R'' = \text{ī}; R^{\sim} = \text{ā}$$

$$\begin{matrix} -R, R = \text{e}; & \begin{matrix} R_{-} \\ R_{+} \end{matrix} \end{matrix} = \text{ũ}; & \begin{matrix} R_{\lambda} \\ R_{\mu} \end{matrix} = \text{ū}; & \begin{matrix} -R^{\sim} \\ -R^{\sim} \end{matrix} = \text{o}$$

Of these ũ, ū and o might be explained as abbreviations of the independent forms of these vowels. In the case of Sign VI 35¹, Proto-Indian has the full independent form of o, But ā, ē, ī, ī, are susceptible of no such explanation. How then are they to be accounted for otherwise than by assuming that like the other independent signs of the Brahmi script, they are descendent from Proto-Indian prototypes. In the case of ũ,  as a variant of  may be an illustration. In the case of ī and ī we have the prototypes in identical shape and (allowing for the reversal of the direction of writing) in the identical position. Since then we have already shown that ' and '' are vowels in Proto-Indian, and we now see that ' and '' are vowels in Brahmi, and that their presence in the script cannot be accounted for except on this hypothesis of descent from lost prototypes, can we avoid the conclusion that Brahmi ' is Proto-Indian ' and Brahmi '' is Proto-Indian '' ? Then we have now fixed the values of Proto-Indian ' and '' viz. ' = ī, '' = ī.

1. See Bühler, "Indische Palaeographie", Pl.II.

It is further quite possible that Brahmi 𑀓 , 𑀔 , is the element 𑀓 in the sign 𑀓𑀔 ; that Brahmi 𑀕 = u, which before the reversal of the script was probably 𑀕 may be from Proto-Indian 𑀕 , (= wa). Again Proto-Indian 𑀖 , may well be the ancestor of Brahmi "R" = o, in spite of the apparent derivation of the Brahmi element "R" from 𑀗 . And even if the later element were accepted as the origin of Brahmi "R", there would still remain the question whether Proto-Indian 𑀘 (which appears only in combination and never independently like 'r') is not itself a modification, for purposes of combination, of the Proto-Indian 𑀘 .

In conclusion we may now regard Proto-Indian 'i' as 𑀙 (or 𑀚), 'e' as 𑀛 , 'a' as 𑀜 , and 𑀝 as o. This will assist us considerably in deciphering the script, as all these signs are of fairly frequent occurrence. To these we may add 𑀞 in combination as 𑀟 , 𑀠 , 𑀡 , 𑀢 , in combination (placed within a sign as in 𑀣 , 𑀤) as 𑀥 , 𑀦 as 𑀧 , 𑀨 is probably wa, which when followed by 'i' contracts to w-i, written 𑀩 , 𑀪 , the element 𑀫 in this case being virtually reduced to a mere labial glide. The symbol 𑀬 which we find only in composition may well be this wa in composition. For if, as we shall see from the analysis of the next table there is reason to regard 𑀭 as a closed syllable, and 𑀮 as an open or compound syllable: it is clear that 𑀬 is the consonantal element preceding the initial vowel of 𑀭 . Now this element is something which if omitted causes the vowel of the dative suffix to coalesce with the initial vowel of 𑀭 , and if inserted serves to bridge the hiatus. Surely then it is a semivowel. And since it is not the semivowel y, it must be the semivowel w. (Compare the form of the labial glide 𑀯 in Ethiopic).

Analysis of Table XXX.

It will be observed in Nos. 14-26 we have the familiar sequence AN-ī. If we were right in analysing this as meaning 'To (the god) AN', it is probable that what precedes is in the nature of a preliminary formula 'For (the life of) Dungi', 'for my life', 'for the patesi' etc. It will be observed that while that which follows in these texts is normally proper names, sometimes prefixed by the 'fish' sign 'son of', that which precedes the dedicatory words "𐎠 is not found elsewhere either as a complete text or in such a position on a text that we might infer it to be a proper name. This confirms us in our inference that what precedes "𐎠 is a formula rather than a name. With regard to the remainder of the texts in this table, it is probable that that which follows " is in every case a proper name (with or without the usual prefixes to proper names such as 𐎠, 𐎠). In many cases there can be no doubt about this, viz. 1, 2, 3, 4, 7, 9, 10, 11, 14-16, 18-22, 25, 26, 28, 32-35, 37, 40, 43, 44, 46, 47-50, 53-57, 61-63, 66, 67, 70, 72, i.e. 44 out of 74. This proportion of certainties is so high that it will probably be not rash to assume till evidence to the contrary that in every case that which follows " is a proper name and utilize this knowledge for the purpose of elucidating those texts which do not contain " .

Conversely it is desirable to point out that of the 60 sequences found preceding " only three (and these only once each) are found as initial elsewhere, viz.

M. 458, 405, and I.13 Now these are very instructive.

Compare M. 458. 𐎠𐎠𐎠𐎠 with text 21. 𐎠𐎠𐎠𐎠 𐎠𐎠𐎠𐎠

If our previous inferences are correct then

M. 458 = 'Servant (of) the god 𐎠𐎠 ' .

and text 21 = 'to the god 𐎠𐎠 (name of owner).

Now compare II.405 𐎠𐎡𐎢𐎣𐎤𐎥𐎦𐎧𐎨𐎩𐎪𐎫𐎬𐎭𐎮𐎯𐎰𐎱𐎲𐎳𐎴𐎵𐎶𐎷𐎸𐎹𐎺𐎻𐎼𐎽𐎾𐎿𐏀𐏁𐏂𐏃𐏄𐏅𐏆𐏇𐏈𐏉𐏊𐏋𐏌𐏍𐏎𐏏𐏐𐏑𐏒𐏓𐏔𐏕𐏖𐏗𐏘𐏙𐏚𐏛𐏜𐏝𐏞𐏟𐏠𐏡𐏢𐏣𐏤𐏥𐏦𐏧𐏨𐏩𐏪𐏫𐏬𐏭𐏮𐏯𐏰𐏱𐏲𐏳𐏴𐏵𐏶𐏷𐏸𐏹𐏺𐏻𐏼𐏽𐏾𐏿𐐀𐐁𐐂𐐃𐐄𐐅𐐆𐐇𐐈𐐉𐐊𐐋𐐌𐐍𐐎𐐏𐐐𐐑𐐒𐐓𐐔𐐕𐐖𐐗𐐘𐐙𐐚𐐛𐐜𐐝𐐞𐐟𐐠𐐡𐐢𐐣𐐤𐐥𐐦𐐧𐐨𐐩𐐪𐐫𐐬𐐭𐐮𐐯𐐰𐐱𐐲𐐳𐐴𐐵𐐶𐐷𐐸𐐹𐐺𐐻𐐼𐐽𐐾𐐿𐑀𐑁𐑂𐑃𐑄𐑅𐑆𐑇𐑈𐑉𐑊𐑋𐑌𐑍𐑎𐑏𐑐𐑑𐑒𐑓𐑔𐑕𐑖𐑗𐑘𐑙𐑚𐑛𐑜𐑝𐑞𐑟𐑠𐑡𐑢𐑣𐑤𐑥𐑦𐑧𐑨𐑩𐑪𐑫𐑬𐑭𐑮𐑯𐑰𐑱𐑲𐑳𐑴𐑵𐑶𐑷𐑸𐑹𐑺𐑻𐑼𐑽𐑾𐑿𐒀𐒁𐒂𐒃𐒄𐒅𐒆𐒇𐒈𐒉𐒊𐒋𐒌𐒍𐒎𐒏𐒐𐒑𐒒𐒓𐒔𐒕𐒖𐒗𐒘𐒙𐒚𐒛𐒜𐒝𐒞𐒟𐒠𐒡𐒢𐒣𐒤𐒥𐒦𐒧𐒨𐒩𐒪𐒫𐒬𐒭𐒮𐒯𐒰𐒱𐒲𐒳𐒴𐒵𐒶𐒷𐒸𐒹𐒺𐒻𐒼𐒽𐒾𐒿𐓀𐓁𐓂𐓃𐓄𐓅𐓆𐓇𐓈𐓉𐓊𐓋𐓌𐓍𐓎𐓏𐓐𐓑𐓒𐓓𐓔𐓕𐓖𐓗𐓘𐓙𐓚𐓛𐓜𐓝𐓞𐓟𐓠𐓡𐓢𐓣𐓤𐓥𐓦𐓧𐓨𐓩𐓪𐓫𐓬𐓭𐓮𐓯𐓰𐓱𐓲𐓳𐓴𐓵𐓶𐓷𐓸𐓹𐓺𐓻𐓼𐓽𐓾𐓿𐔀𐔁𐔂𐔃𐔄𐔅𐔆𐔇𐔈𐔉𐔊𐔋𐔌𐔍𐔎𐔏𐔐𐔑𐔒𐔓𐔔𐔕𐔖𐔗𐔘𐔙𐔚𐔛𐔜𐔝𐔞𐔟𐔠𐔡𐔢𐔣𐔤𐔥𐔦𐔧𐔨𐔩𐔪𐔫𐔬𐔭𐔮𐔯𐔰𐔱𐔲𐔳𐔴𐔵𐔶𐔷𐔸𐔹𐔺𐔻𐔼𐔽𐔾𐔿𐕀𐕁𐕂𐕃𐕄𐕅𐕆𐕇𐕈𐕉𐕊𐕋𐕌𐕍𐕎𐕏𐕐𐕑𐕒𐕓𐕔𐕕𐕖𐕗𐕘𐕙𐕚𐕛𐕜𐕝𐕞𐕟𐕠𐕡𐕢𐕣𐕤𐕥𐕦𐕧𐕨𐕩𐕪𐕫𐕬𐕭𐕮𐕯𐕰𐕱𐕲𐕳𐕴𐕵𐕶𐕷𐕸𐕹𐕺𐕻𐕼𐕽𐕾𐕿𐖀𐖁𐖂𐖃𐖄𐖅𐖆𐖇𐖈𐖉𐖊𐖋𐖌𐖍𐖎𐖏𐖐𐖑𐖒𐖓𐖔𐖕𐖖𐖗𐖘𐖙𐖚𐖛𐖜𐖝𐖞𐖟𐖠𐖡𐖢𐖣𐖤𐖥𐖦𐖧𐖨𐖩𐖪𐖫𐖬𐖭𐖮𐖯𐖰𐖱𐖲𐖳𐖴𐖵𐖶𐖷𐖸𐖹𐖺𐖻𐖼𐖽𐖾𐖿𐗀𐗁𐗂𐗃𐗄𐗅𐗆𐗇𐗈𐗉𐗊𐗋𐗌𐗍𐗎𐗏𐗐𐗑𐗒𐗓𐗔𐗕𐗖𐗗𐗘𐗙𐗚𐗛𐗜𐗝𐗞𐗟𐗠𐗡𐗢𐗣𐗤𐗥𐗦𐗧𐗨𐗩𐗪𐗫𐗬𐗭𐗮𐗯𐗰𐗱𐗲𐗳𐗴𐗵𐗶𐗷𐗸𐗹𐗺𐗻𐗼𐗽𐗾𐗿𐘀𐘁𐘂𐘃𐘄𐘅𐘆𐘇𐘈𐘉𐘊𐘋𐘌𐘍𐘎𐘏𐘐𐘑𐘒𐘓𐘔𐘕𐘖𐘗𐘘𐘙𐘚𐘛𐘜𐘝𐘞𐘟𐘠𐘡𐘢𐘣𐘤𐘥𐘦𐘧𐘨𐘩𐘪𐘫𐘬𐘭𐘮𐘯𐘰𐘱𐘲𐘳𐘴𐘵𐘶𐘷𐘸𐘹𐘺𐘻𐘼𐘽𐘾𐘿𐙀𐙁𐙂𐙃𐙄𐙅𐙆𐙇𐙈𐙉𐙊𐙋𐙌𐙍𐙎𐙏𐙐𐙑𐙒𐙓𐙔𐙕𐙖𐙗𐙘𐙙𐙚𐙛𐙜𐙝𐙞𐙟𐙠𐙡𐙢𐙣𐙤𐙥𐙦𐙧𐙨𐙩𐙪𐙫𐙬𐙭𐙮𐙯𐙰𐙱𐙲𐙳𐙴𐙵𐙶𐙷𐙸𐙹𐙺𐙻𐙼𐙽𐙾𐙿𐚀𐚁𐚂𐚃𐚄𐚅𐚆𐚇𐚈𐚉𐚊𐚋𐚌𐚍𐚎𐚏𐚐𐚑𐚒𐚓𐚔𐚕𐚖𐚗𐚘𐚙𐚚𐚛𐚜𐚝𐚞𐚟𐚠𐚡𐚢𐚣𐚤𐚥𐚦𐚧𐚨𐚩𐚪𐚫𐚬𐚭𐚮𐚯𐚰𐚱𐚲𐚳𐚴𐚵𐚶𐚷𐚸𐚹𐚺𐚻𐚼𐚽𐚾𐚿𐛀𐛁𐛂𐛃𐛄𐛅𐛆𐛇𐛈𐛉𐛊𐛋𐛌𐛍𐛎𐛏𐛐𐛑𐛒𐛓𐛔𐛕𐛖𐛗𐛘𐛙𐛚𐛛𐛜𐛝𐛞𐛟𐛠𐛡𐛢𐛣𐛤𐛥𐛦𐛧𐛨𐛩𐛪𐛫𐛬𐛭𐛮𐛯𐛰𐛱𐛲𐛳𐛴𐛵𐛶𐛷𐛸𐛹𐛺𐛻𐛼𐛽𐛾𐛿𐜀𐜁𐜂𐜃𐜄𐜅𐜆𐜇𐜈𐜉𐜊𐜋𐜌𐜍𐜎𐜏𐜐𐜑𐜒𐜓𐜔𐜕𐜖𐜗𐜘𐜙𐜚𐜛𐜜𐜝𐜞𐜟𐜠𐜡𐜢𐜣𐜤𐜥𐜦𐜧𐜨𐜩𐜪𐜫𐜬𐜭𐜮𐜯𐜰𐜱𐜲𐜳𐜴𐜵𐜶𐜷𐜸𐜹𐜺𐜻𐜼𐜽𐜾𐜿𐝀𐝁𐝂𐝃𐝄𐝅𐝆𐝇𐝈𐝉𐝊𐝋𐝌𐝍𐝎𐝏𐝐𐝑𐝒𐝓𐝔𐝕𐝖𐝗𐝘𐝙𐝚𐝛𐝜𐝝𐝞𐝟𐝠𐝡𐝢𐝣𐝤𐝥𐝦𐝧𐝨𐝩𐝪𐝫𐝬𐝭𐝮𐝯𐝰𐝱𐝲𐝳𐝴𐝵𐝶𐝷𐝸𐝹𐝺𐝻𐝼𐝽𐝾𐝿𐞀𐞁𐞂𐞃𐞄𐞅𐞆𐞇𐞈𐞉𐞊𐞋𐞌𐞍𐞎𐞏𐞐𐞑𐞒𐞓𐞔𐞕𐞖𐞗𐞘𐞙𐞚𐞛𐞜

If our previous inferences are correct then



W. 405 = '  , - Goddess (?)' ¹








and text 67 = 'To ^w~~A~~ III ^a~~O~~, Servant of X^m T'

from which we see (a) that \diamond and \heartsuit are determinations (or titles) of divinity, probably male and female, (b) that these determinations (or titles) are placed after the word they qualify, (c) that they may be omitted, (d) that $|||$ is a variant of $||||$, which proves they are not numerical signs, (e) that λ^w is a variant of λ^{uw} .

Compare 1.13 $\begin{bmatrix} \text{---} \\ \text{---} \\ \text{---} \end{bmatrix} \begin{bmatrix} \text{---} \\ \text{---} \\ \text{---} \end{bmatrix} \hat{e} \psi \begin{bmatrix} \text{---} \\ \text{---} \\ \text{---} \end{bmatrix} = (\text{To}) \psi \begin{bmatrix} \text{---} \\ \text{---} \\ \text{---} \end{bmatrix} (\text{name})^2$

and text no. 37 $\psi \times \overline{\psi} =$ To ψ (name).

So the three exceptions only serve to strengthen our conviction that  is a symbol of divinity (or by itself a god's name like Sumeric  = Anu or dinir), that " is dedicatory (a dative suffix), and that what precedes it is either a god's name or a prayer.

If we combine the evidence of the contexts where ' is a semivowel and those where " is elided we find that the signs. III, V, , , A, N, ,  III, III³, are closed syllables,    are open syllables.

Analysis of Tables XXXI - XXXVII.

In this table we have the numerical signs from 3 to 9. The principal evidence that these are numerical signs is their remarkable correspondence with the same numerical signs in Proto-Elamite and Sumerian. It will be noted that the commonest occurrence of these signs is with the tree sign. All of

them without exception are found with this sign (in the case of 8 the numerical is compounded with γ doubtless for phonetic reasons). With some this combination forms the majority of the total number of occurrences of the numeral sign. It has been already suggested that we may regard this combination as the sign plus the ordinal suffix. Indeed in view of the fact that this combination is found as a complete text, presumably a proper name, in Nos. 2, 17, 18, 25, 72, 76, 83, 113, it is difficult to conceive any other explanation. Doubtless " and ' were originally numerical signs, but they do not appear in any contexts that will bear a numerical interpretation in our texts. They were used to represent the vowels $\underline{\gamma}$, \underline{i} , with which their numerical values were perhaps homophonous, and to avoid confusion the place of " , as a numeral seems to have been taken by || , at least when the numeral sign for '2' was required in a proper name. This at least is what appears to be suggested by the evidence of Table XXXVI, Nos. 84-87, especially 84, where we get γ || appearing as a complete text just like Nos. 2, 17, 18, etc. mentioned above. It will be observed that sometimes this || resumed its original size " , and was then written in the middle of the line (see Table XXXVI, Nos. 123-125). But this would not be easy to distinguish from the vowel " which was also occasionally written towards the middle of the line (See Table XXX, Nos. 1-7), and consequently the elongated form || appears to have been normally adhered to. The form | is probably the numeral equivalent of ' , but does not appear to be used in a numerical sense in these texts except in No. 45 of Table XXXVII. To decide whether in a given text a numeral sign is to be read as a numeral or as a word or syllable that happens to be a homophone of that numeral we have two indicators: (a) the recurrence of a particular

sign accompanied by several different numerical signs, (b) the recurrence of one numeral sign, and one only, a number of times with one and the same non-numeral sign. In the former case the numeral sign is to be read as a numeral, in the latter as a homophone unconnected with any numeral except by the accident of phonetic identity. There will remain a number of cases where a given sign is found only once or twice with a numeral sign. These will remain for the present dubious.

Applying the above criteria we find that when a numeral sign is followed by Υ , $\hat{\Lambda}$, $\hat{\Lambda}$, \cdot , \times , \mathcal{V} it is to be read as a numeral,


where the numeral $'''$ is followed by \mathcal{V} ;





where the numeral $|||$ follows \mathcal{V} ; where it precedes \emptyset ;


where the numeral $||$ precedes \square , \diamond , \uparrow or follows \emptyset in the sequence $\mathcal{V} || \emptyset$; in all cases where $|$ occurs except H. 153; it is not to be read as a numeral.

Table XXXVI, No. 82 is very interesting; it shows that " written in the middle of the line can be substituted for $||$ and is thereby sharply differentiated from " the vowel. The vowel " and the sign $||$ are distinct in the script, and it is perhaps scribal carelessness, or perhaps a survival of the era before their differentiation, that accounts for both occasionally appearing as " . They are however never found both written this way on one and the same text.

With regard to $|||$, $||||$, $|||||$ an examination of the plates will show that the length of the strokes varies considerably, especially with the "tree" sign. With \mathcal{V} the length of the accompanying $|||$ is apparently constant. The difference in length is probably determined merely by convenience and an aesthetic consideration for the appearance of the

The signs in Tables XXXIV and XXXV are probably not of numerical origin. Since (a) it is unlikely on Sumerian or Proto-Elamite analogy that the digits were represented by single strokes exceeding 9 in number, (b) there are no intervening signs of 10 and 11 strokes, (c) the signs are not found in the normal numerical sequences, notably YR. The pictographic origin of these signs is perhaps to be found in the ornamental design on the symbol  (see Plate I). If this be so it is quite possible that the three signs in Col. IV of Tables XXXIV and XXXV should be regarded as simple variants.

It is possible that in some cases at least |||| , |||| (Table XXXVI) |||| , |||| are to be regarded not as numeral signs but as simple variants of a single sign of non-numerical origin whose pictographic original has been lost. Perhaps a fence? This is suggested by a comparison of texts 82, 92, 93 of Table XXXI, and of texts 2-5 of Table XXXVI. The normal way of writing the numerals would appear to be | ; || ; ||| ; |||| ; ||||| (rarely ) ;  ;  ;  . It is not certain how 10 was written.

That which is found on the Harappa prisms is the numeral 10, and that the prisms themselves (which usually contain names identifiable with those on the seals on one side) are receipts of tribute, etc.  , Table XXXII is not likely to be a graphic variant of ||| numeral, since in the uneven numbers the majority of strokes is always placed in the upper layer as in Sumerian and Proto-Elamite.

' , Table XXXIII, is not likely to be a graphic variant of ' since it appears in no normal numerical sequence. It may be compared in shape with the Proto-Klamite ' (See D.E.P. XVII. Tablets passim, usually in the first column, but never initial as here in texts 5, 6).¹ We may now consider ' in texts 14'-116 of Table XXXI. Inasmuch as ' is found preceding U in No. 112, where it is clearly phonetic (U is preceded by no other numeral of the Table), (2) ' is only found in 5 instances, Nos. 114-116, 118, 120, in all of which it is separated from other combinations of short strokes by only one intercalated sign, (3) in 116, which seems to be an identical word with those contained in 114 and 115, the order of the strokes is reversed without apparent derangement of the sense, I conclude that 'R' and 'R' are but ' combined. Similarly 'Y' is but Y' combined (doubtless on phonetic grounds). It is significant that Y are normally preceded by numeral signs. Similarly 'A' is A' 2, 'X' is X' ; which again is what we should expect since elsewhere X is preceded by numeral signs. And 'X' is X' . With regard to the sign ' ' in Table XXXI. It might be taken for a divided form of ' if any such sign existed. But as we have just shown it does not. '4' is always written ' . There is no sign of which ' ' could be a form modified for purpose of combination. Moreover it is quite certain that in the case of 'A' at least we have no compound of the ordinary sort. For from all we have seen of compounds the enclosed portion is always to be read last. Now in the case of Nos. 45 and 46 this would break up two well established sequences. Here the element ' ' can only represent a modification of or addition to the final syllable of the words 'A' , 'Y' . In these two cases the

1. Cf. also Brahmi ' = Y. It is possible that this may be an alternative writing for when i is used as a full vowel syllable, and not as a semivowel, or the vowel element a oo sonantal syllable. 2. Cf. M.311.

modifying element ' ' would appear to make no difference to the sense, but to be merely euphonic due perhaps to these words being final: they are final nowhere else (see Table XIII). In the case of No. 41, ' ' seems to affect the sense as well as the sound of X , which would appear to be a name in itself. 'To X ; The son of ' X '. X is nowhere else found final. The same remarks apply to the occurrence of ' ' with X . A comparison of Table XIII, 163 and 181 with 195 and 197 would indicate that in these cases X and ' X ' were identical in sense, and if not identical at least interchangeable in sound. It will be observed that in the fragmentary text 53, ' X ' is final:¹ elsewhere X is never final - or solus. Here then there would appear to be a change of sense. In text 55, ' X ' is also final. It is only once final elsewhere (Table XIII, 297). In text 58, ' \square ' is final, and solus; in 61 it is also final. Elsewhere \square is only once final (Table XXI, 34). It is noteworthy not one of the sequences found with \square are found with ' \square ', notably $\Psi \square$: so perhaps ' \square ' is modified in sense as well as sound. ' O ' is final in every occurrence; O is never final. ' ψ ' is final in No. 66. ψ is never final.

What sort of a graphic modification then is this which usually alters the sense, but not always; which alters the sound but slightly; which has a marked tendency to attach itself to certain syllables when final? An indication may be obtained through Table XXXIII, No. 9. Here we have a sign X which is almost certainly to be identified with ' X ', seeing how often ' ' attaches itself to the fish group, including the variety X . Now if we turn to the Asoka Edicts we find ' represents the anusvar - and indeed does still in the scripts derived therefrom to this day! It is possible that this is the Brahmin reduction of a sign which in Proto-Indian on grounds of symmetry, was distributed equally about the sign

1. and indeed solus.

i.o. : , ' may well be the sign of the nasalisation of the syllable. It has been already observed that the fish group are open syllables. ㄣ , ㄨ , ㄨ are probably also. Nasalisation is often merely euphonic, though of course in some cases a nasalised syllable may make a word quite distinct from the same syllable un-nasalised. It is unnecessary to labour this fact which of course is common to many languages.

A comparison of Texts 47 and 48 shows that the sign of nasalisation could be attached (written around) the last syllable or the whole word optionally. Graphically the latter would be analogous to the convention regarding the writing of a polysyllabic word as an 'integral' compound.

In Text 34 ㄨ (ㄨ) is probably for ㄨ ㄨ See analysis of Table XXVI.

Analysis of Tables XXXVIII-XLII.

It was argued in Table XXIV that ㄨ was a form of the dative suffix, alternating with " and ' when preceded by ㄨ. An examination of texts 12-18, 29, 30, 43 suggests that in the sequence ㄨ ㄨ also ㄨ is the dative suffix since (1) the sequence is normally initial, (2) is unconnected with what follows it. In the case of the sequence ㄨ ㄨ , Texts 1-11, 31, 37, ㄨ is clearly part of the word, unconnected in meaning with the dative suffix, though doubtless homophonous with it.

Now in regard to the pronunciation of ㄨ , if ' is ㄨ and " ㄨ , ㄨ may well be ㄨ and ㄨ , i.e., long and short i pronounced with a labial glide. If ㄨ is cognate to ㄨ in sense, as it well may be judging from its contexts, it is possible that it is the same word differently articulated. If ㄨ is AN ㄨ may be UN. Then we should understand the labial glide before ㄨ. That / , / may be wa (and so ㄨ ㄨ)

is also suggested by the form of the Brahmi \bar{u} which may well be derived from it. Have we also a Proto-Indian prototype of Brahmi \bar{u} ? I think we have in the element 𑀓 which we find in composition in certain Proto-Indian signs, viz. 𑀓𑀓 , 𑀓𑀓𑀓 , 𑀓𑀓𑀓𑀓 . But the original form in Proto-Indian may have been 𑀓 for which the stroke at right angles served as a support. The form 𑀓 seems to appear in 𑀓𑀓 . For it would seem fairly certain that 𑀓𑀓 is 𑀓 articulated with a labial vowel on the evidence of 𑀓 , which is the only variety of 'fish' that follows it, (see Table I, Nos. 388, 390, 391). Can we infer from this that the numeral sign 𑀓 on our texts is the same as this vowel \bar{u} ? I think not. It would be most strange if the first three numerals were pronounced \bar{y} , \bar{i} , \bar{u} , respectively. How independent \bar{u} (as distinct from \bar{u} in composition) was written in our script I have not discovered. The phonetic value of 𑀓 , 𑀓𑀓 , 𑀓𑀓𑀓 as numerals is probably quite distinct from their value as vowels. That the vowels should be written with numeral signs is an arrangement obviously artificial, but very comprehensible. It shows that their origin does not go back to the ideographic stage of the script but is a later development of a phonetic age. That this age should be circa 3,000 B.C. is interesting.

If \bar{u} in composition in Proto-Indian is written 𑀓 and 𑀓 , how is \bar{y} written? This brings us to an examination of 𑀓 .

If 𑀓 is 'wa' what is 𑀓 ? The attachment of an inclined stroke to the lower portion of a sign is found in the case of 𑀓 (see Table LIII) and 𑀓 (see XLIX, 38, 39)¹. In these cases it is clearly a modification of the vowel of the syllable. Now if, as we have shown, there is reason to think 𑀓 which in Brahmi syllables indicate \bar{y} , \bar{i} , are derived from Proto-Indian 𑀓 , 𑀓 then surely 𑀓 , 𑀓 which in Brahmi

1. Cf. also 𑀓 Table (Table LXXXIV).

Analysis of Table XLIV.

The sequences show that the first two signs in Col. IV and the signs given in the column against texts 37-41 are variants. The original form is probably)(, whence ʃ and then { , by drawing the left half of the sign further to the right and shortening it. The key sequence is ↑R. In text No. 41 this word is written as an integral compound)(↑(

The last two signs are probably quite independent, being of different ideographic origin. The signs ʃ } > are variants of one another, but as the key sequences ↑R,

ʃf/R, R 𐎶 show, quite independent of { . The reversed aspect of these signs is purely accidental, and their ideographic origin quite distinct. } is clearly allied to > as the sequence ʃf/R shows. Whether the internal strokes are in the nature of a gunu modification involving no modification of sound or sense (as sometimes in Sumerian), or represent a modification of the vowel, or indicate merely an older and fuller form of the sign it is not at present possible to decide. On the whole I incline to the gunu explanation of all these additions of more than one interior stroke, e.g., in 𐎶, 𐎶, 𐎶, 𐎶.

Analysis of Table XLV.

All the signs in Col. IV are variants. The reversing of the sign in texts 25, 26, seems to be without significance. As we have seen the compound here is <𐎶 . As),> is normally preceded by a numeral, it is unlikely that < is anything but a simple variant of > . Indeed we need not suppose deliberate reversal, for a comparison of the form } , with 𐎶 in Table XLIII suggests that } is the original form of which > and < are abbreviations made by taking the upper and lower portions of } respectively. It would further

appear that ideographically \gg , \gg is but the doubling of \rangle , \rangle .
 as that \rangle , \rangle is the halving of \gg , \gg .

Analysis of Table XLVI.

From the sequences it would appear that all the signs in Col. IV are variants. The full and early forms are probably the second and third: the latest \uparrow and \uparrow . The sign is probably an umbrella. (See analysis of Table XLIX, end).



Analysis of Table XLVII.



The first two are clearly variants by their graphic resemblance. Cf. Υ and Υ . The fifth may be classed as a variant for the same reason, but with less assurance. The third may be a later and more conventionalised form by separating the horns (?) from the arms (?), straightening out the former, and amplifying the head (?). Morphographically there is a curious parallelism between \uparrow and Υ on the one hand and \uparrow and Υ on the other. If \uparrow is ideographically a man, perhaps Υ is a god or hero, the additional element being horns (cf. design on M.440). \uparrow Υ (cf. Υ Table XLIX, No. 30) may be a man with legs together, and Υ a divinity in similar posture.

Υ is clearly $\Upsilon + \wedge$, the vowel o.




The last sign in column IV is doubtfully a compound, as we have no sign Δ elsewhere. It may be a modification by means of \prime (see analysis of Table XXVI).





Analysis of Table XLVIII.

The key sequence is R^{||||}. This shows that the first five signs in Col. IV are identical. A comparison of texts 32, 33 shows that the sixth sign is also a simple variant of the fifth. Regarding the forms ,  there is little indication to be obtained from the sequences. But their shape and the fact that the varieties 1-6 show considerable divergence may justify us in concluding provisionally that they are variants.

The last sign is probably a compound of  and 
(see Analysis of Table III).

Analysis of Table XLIX.

The sequences indicate that the first five signs are all variants. The key sequence in this Table is R^V. The form  is interesting as being an exact approximation to the Brahmi form of the sign. The fifth form is perhaps the oldest. The sign is clearly the silhouette figures of a man. The sixth and seventh signs in Col. IV are probably the base form modified by the vowel Y. The eighth and ninth are probably pictographically independent. They have their exact parallels in Egyptian. But the sequence R^V in texts 39 makes it possible that  may be a variant of .¹ The tenth sign is probably, almost certainly, the base form modified by the vowel u. In view of what we have noted regarding the fluidity of the liquid vowels it is not surprising to find this

1. We have said in the Analysis of Table I that  after  is probably the determinative 'servant'.  may be the Egyptian determinative 'high' signifying that the man  (servant of 0) was a high official.

sign in the same sequence as the sixth and seventh. The eleventh sign is probably a variant of the tenth. It is not probable that the position of the modifying vowel relative to the sign is pertinent in view of the evidence of texts 32, 33. If λ were bi and λ ib we should not expect an identity of sequence. The twelfth sign is probably the base form modified by $\Delta = g$.

The thirteenth sign (texts 42, 43) is pictographically different from the first, but it appears in identically similar circumstances (cf. Nos. 14 and 42). It is probably, like λ and λ' a determination. In shape it approximates to the Egyptian sign for a man, performing the hny rite. The next two signs in Col. IV closely resemble the Egyptian determinative dwt 'plus' the sign U. From the evidence of Table XXXI, 42, we know that U|| are to be read together as one word or phrase, || being a numeral and U some numerable object forming the subject matter of a receipt. To this object is ligatured the determinative dwt 'plus'. The object itself is then probably a slave. It is difficult to think of any other commodity which could be at once the subject of a receipt and qualificable by the determination dwt . The texts then probably read "From X (name) two slaves - dwt . "From Y two slaves - dwt . For there are strong reasons for taking E as the suffix 'from' (See Analysis of Table LVIII).

With regard to the next two signs in Col. IV, the second is but the first reversed, and this reversal is due to the reverse of text 43 being read boustrophedon from left to right. Is the sign λU to be read as U ligatured to its determination, or as a phonetic compound standing for λU , or as an ideographic compound? Against the first it may be argued that λ is never followed by " , while its 'compounds' are so found on four occasions - texts 46, 58, 64, 85. The same evidence is opposed to regarding it as a phonetic writing arising from

euphonic considerations. We may then regard it either as a true compound phonogram (a compound of two syllables to form a word unconnected in meaning with that of either of its syllables) or as a compound ideogram. In selecting between these we have to guide us only the analogy of the script from which the compound may have been borrowed, and the rationality of the compound from the ideographic point of view. We may compare the sign with Gardiner. E.Ĝ. p. 439, Nos. 36, 37, where it is an ideogram - 'brewer'. The element U in Proto-Indian may well have been a vessel¹, like the parallel element in its Egyptian fellow.

Similarly 𐀀 may be in Egyptian op. cit. p. 437.24

" 𐀁 " " " " " " p. 437.21

" 𐀂 " " " " " " p. 439.34

" 𐀃 " " " " " " p. 439.35

" 𐀄 " " " " " " p. 436.12

The last two signs in Col. IV are probably variants of 𐀅
Of. texts 70 and 86 for sequence R| , R||

𐀆 is perhaps a man with shield, an ideogram for 'defence'.

𐀇, 𐀈 a standard-bearer.

𐀉 a man with a fetter on his leg - a prisoner.²

The next sign in Col. IV is a man invoking (Gardiner op. cit. p.438.27) plus the sign of divinity in the plural =
'He who invokes the gods'.

The next sign is probably an ordinary phonetic compound.
If we separate its syllables and read P𐀊 / 𐀋 we get the

1. This of course without prejudice to its meaning 'slave' in the contexts aforementioned. The words for slave and vessel may well have been homophonous.

2. I am indebted for this suggestion to Professor Langdon.

sequence 𐎧 and 𐎨 final, both of which are well established elsewhere. Had the scribe desired to make a compound ideogram of a man and a flag he would probably have written 𐎧𐎺 on the analogy of 𐎧𐎺.

The next sign is probably ideographic representing a man with umbrella. It is clearly a combination of 𐎧 and 𐎺

Analysis of Table L.

The first two signs are simple graphic variants. The last sign is compounded of 𐎧 and 𐎺. It is probably an ideographic compound like 𐎧𐎺. If 𐎧 is ideographically 'man' and 𐎧 a horned man, i.e. hero or god, and if 𐎺 is a bow and arrow, the 𐎧𐎺 = archer and 𐎧𐎺 = divine archer.


Analysis of Table LI.







From the sequences we see that the signs in Col. IV are simple variants. The sign seems to represent a bird inclined at an angle of 90°. It is clear from a comparison of the sequences that the sign stands for a word that is distinct from the word or words represented by the other bird signs (Table LXXIII, XCIX).














Analysis of Tables LII and LIII.







It is not always easy to distinguish 𐎧 and 𐎧 in the texts from their shape alone. But that they are distinct is clear (a) from the evidence of their sequences, (b) from the fact that both varieties occur on the same text: see 4, 6, 12, 16, 22, 34, of Table LII. The last sign in Col. IV of Table LII is almost identical with the second sign in Table LIII. Yet the sequence shows that it clearly belongs to Table LII. It is more likely that the two forms had






independent pictographic origins, than that the one arose from the other by intentional differentiation. As we have seen when Proto-Indian desired to form new signs by differentiation they did it by the addition of strokes, and that in a manner to make the differentiated sign readily distinguishable.

The first sign in Table LIII, plus ' , is merely a carelessly made  of texts 16, 17, and Table LXXXI.

 is a modification of  , probably by substituting the vowel u for the (inherent) vowel a. The change is not made on euphonic principles, since  is found between the same signs as  . The phonetic modification is therefore to be attributed to dialectal variations in the pronunciation of the word  

 is a phonetic compound of  and  . It is elsewhere written as separate signs, see texts 4-9, and especially 4 and 5. Now why should it be optional to write   or  ? Surely because it was optional to pronounce the combination as two syllables, or as one syllable by contraction. Now it has been shown that  has probably the value wi, ui, or u.  is probably a syllable ending in a, since the addition of  , can be made to it for purposes of vowel modification. Then in   we have ba-wi while in   we have b'wi.¹

 by its position in the text is probably an effaced form of  and the two signs following the letter in Col. IV. These four signs are probably  modified by ū. The 'chevron' strokes seem to be of the gunu order, without effect (?) on the sound or meaning of the sign, cf.  ,  ,  But they may be ū forms. See Analysis of Table XCI, note (1).

 and  are probably compounds of  with  and  respectively. Whether these compounds are ideographic or phonetic is impossible to say on the evidence.

The last two signs in Col. IV are clearly allied or

1. Or it may be an "integral" compound.

identical judged by their shape and the sequence R ∇ . The fact that the first has one short interior stroke, and the second two, leads us to regard them as allied rather than identical: vowel modifications of a base-form ∇ which however is lost, its value being supplied no doubt in our script by a homophonous sign. These two signs are probably ideographically distinct from the other signs in Col. IV.

Analysis of Table LV.

Clearly all variants.

Analysis of Tables LVI-LVII.

With regard to the first five signs in Col. IV. The key sequence }R shows that the third and fourth are identical. The presence of one or two horizontal bars in the sign is therefore immaterial. Signs 1-3 may therefore be regarded as identical. Now this group can be linked up with sign 5, though doubtfully, through the sequence ∇ R, ∇ R. If we now consider Col. IV of Table LVII, we may admit the possibility of the third sign of Col. IV being the prototype, from which were evolved ∇ (found only in Susa) ∇ , ∇ and ∇ ; of this sign having a phonetic value containing a vowel other than a; and of ∇ , ∇ , ∇ being derived from this sign by dropping the interior perpendicular strokes (originally two of the quadruped's legs) to serve as a sign for a word with the same consonantal element as ∇ but with the vowel a. This assumes that the base form represents a syllable containing a liquid vowel. Such a device could of course only arise among a people familiar with the principle of modifying a syllables to form i, e, u syllables by the addition of perpendicular strokes.

Texts 15 and 16 of Table LVI are clearly parallel, so that the signs against them in Col. IV are to be treated as

allied or variants. The sign against text 15 is apparently defective. It would seem that the original was \equiv , a compound of \equiv + D . The sign against No. 16 is apparently the same plus the vowel \wedge = o . The compound \equiv is phonetic. It is found dissolved in Text. No. 5.

The last sign in Col. IV of Table LVI is a compound of \equiv and \equiv

Analysis of Table LVIII.

All the signs in Col. IV, except the last two are clearly variants. The last two are probably variants of each other. That they are variants of the remainder is most improbable in view of both varieties occurring on the same text (No. 95). They are therefore probably quite independent of and ideographically different from the rest of the signs in Col. IV.

Regarding \equiv and its graphic variants we note (a) it is normally final, (b) it is found on some seals, including one (text 74) with the common dedicatory formula 'To God', (c) it is found abundantly, almost invariably, with the documents containing on one side \vee accompanied by a numeral. These documents contain on the other side a name or title followed by

\equiv . They are not seals, nor impressions, but are lightly incised for direct reading, as is clear from the direction of the writing which is from right to left.¹ These documents are peculiar in shape: they are as a rule either rectangular or lozenge shape, differing alike from the seals and the votive tablets in their dimensions. Several however are written on three-faced prisms, and one or two on two-faced slabs of a peculiar shape, see Plate XXXI, No. 100, Plate XXXIV, Nos. 160, 161. The fact that this class of document is almost invariably accompanied by a numeral, followed by the object

1. With a few exceptions.

enumerated; that it is written, not stamped, on a material of special format evidently prepared for the purpose, seems to suggest that here we have a class of business document. The fact that one side contains a man's name, and the other the object enumerated suggests that this document is in the nature of a receipt or promissory note. The fact that the man's name is almost invariably followed by the suffix $\bar{\epsilon}$ suggests that that suffix means 'from'. That this sign should also be found on certain seals in the same final position is confirmatory evidence; since we know from the dedicatory formula, and from the impressions made from these seals on thin rectangular slabs printed on both faces, that these seals were primarily fashioned for the purpose of manufacturing votive tablets. It is natural then that some of them should begin with the dedicatory formula and end with 'from'. Of course in many cases either the dedicatory formula or the suffix 'from' or both were omitted. This probably increased with the passage of time and the tendency to use and manufacture the seals more for the purpose of indicating ownership than offering prayers.

It will be observed that when the sign is reversed the writing also is reversed: Nos. 86-88, 91-93. Yet not always, see text 90.

Analysis of Table LIX.

The second sign in this table should probably not have appeared here but been placed in Table XLVI on morphographical grounds. The resemblance in sequence between texts 5 and 8 is illusory as $\int_{\lambda}^{\mu} \text{|||}$ forms a single word.

The remaining signs in Col. IV are shown by their sequence to be simple variants. The earliest form was probably B_{\uparrow} , the ears being subsequently modified finally to disappear. Cf. Analysis of Table XIX.

Analysis of Table LX.

The sequence ④ R makes it certain that all except the last two are simple variants. The penultimate and ultimate can hardly be regarded as otherwise on morphographic grounds.

Analysis of Table LXI.

The first sign in Col. IV has been included in this rather than in the preceding table on account of the identity of sequence as between texts Nos. 2 and 13. The evidence of their texts again, added to that of H.110 obverse and reverse (texts 3 and 11) shows that in the case of this series of signs the addition of internal strokes makes no difference in sense or sound, and that all the signs in Col. IV are to be regarded as simple variants.

Analysis of Table LXII.

The first sign in Col. IV though only once found alone, is found twice in a compound. (See Analysis of Table LVI). The sign appears to be a bow. It is ideographically and phonetically distinct from the remaining signs of Col. IV. These are all variants of one another. The sign 𐀔 represents a bow and arrow. It is noteworthy that it is never followed by 𐀠, which suggests that 𐀠𐀔 is not a phonetic compound.

Analysis of Table LXIII.

The sequences show that the first five signs in Col. IV are simple variants, and this being so it is probable that the remainder are also variants.

Analysis of Table LXIV.

The second sign in Col. IV may be $\chi + \wedge$, i.e., the syllable χ pronounced with o. The third sign may be ideographically independent.







χ is probably $\chi + \sqcap$. The latter element is found also with \triangle and \bowtie . (Tables LXVI and LXXVI). It is not found independently, so that it is unlikely that we have here a compound of two signs. It is more probably to be explained as a modifying element, like \wedge . As we have said above \sqcap probably represents a labial glide.¹ χ is conceivably χ modified by the anusvar. In that case the original form of the anusvar would be $\begin{smallmatrix} \circ & \circ \\ \cdot & \cdot \end{smallmatrix}$, of which $\begin{smallmatrix} \cdot & \cdot \\ \cdot & \cdot \end{smallmatrix}$ and $\begin{smallmatrix} \cdot & \cdot \\ \cdot & \cdot \end{smallmatrix}$ would be later variants. \diamond in Table XXVI would thus be explained as $\diamond - \chi$.

Analysis of Table LXV.





The short interior strokes in the second and third signs of Col. IV seem to be significant since they are found side by side with the base form in N.133 and 227 (texts 2-5). We may assume that they are \triangle with the vowel modified. The sequences in the two texts are really identical, since N.133 is to be read from left to right (see Analysis of N.133 in 'Direction of the Writing' p. 3: above). It is not probable that the modification by one or more strokes is material in this sign, since in No. 15 we have as many as four interior strokes. The sign in this case is clearly phonemically allied to the base form since it appears in the same sequence. Cf. text No. 11. The form \bowtie is but a defective form of χ , of which \circ is a mere graphic variant.

The last sign in Col. IV may be an earlier and fuller form of χ , or it may be a compound of it and $\begin{smallmatrix} \cdot & \cdot \\ \cdot & \cdot \end{smallmatrix}$.










Analysis of Table LXVI.

The distinction between  and  in the sequences is so marked that it is probable that they are ideographically distinct. It is possible however that the second is the first modified by the addition of four short lines.  . Cf. the modification  , which we have taken to be the Brahmi anusvar. Cf.  

Analysis of Table LXVII.

All the signs in Col. IV are clearly variants except the last two. These are clearly compounds of  +  The analogy of texts 16-18 shows that the compound is phonetic and is to be read   'king of the mountains' (?). I am at a loss to account for the reversal of the compound in text No. 20 as there can be no question here of a reversal of the direction of writing. It is perhaps a scribal error of shading the wrong triangle! It is the only case we have of a compound in which the elements appear reversed (except when the writing is also reversed).

Analysis of Table LXVIII.

In text No. 2 the initial sign is not to be taken as a variant of  . Nevertheless the final position of  combined with its shape will justify us in assuming  to be a variant of  . Pictographically it is explicable, if  be the human eye, as Sumerian analogy would lead us to suppose. Then the interior dot will represent the pupil of the eye. So then the first sign in Col. IV is to be taken as the fuller and older form. As already remarked, functionally  seems to correspond to  . But the sequences commonest with  and  are mutually exclusive. So much so that if names ending

In \check{V} are of substantival composition like Jamna-dass, names ending in \uparrow may well be of completely different, say verbal, composition, like Untaš-gal.

Analysis of Table LXIX.

That \uparrow is ideographically distinct from either \uparrow or \uparrow is suggested by its appearance in the texts doubled. Doubling is a marked and distinctive feature of certain signs (cf. Table X0II), while other signs seem to be at pains to avoid it (cf. Table XIII). It is probably in origin an ideographic representation of the dual number of a word, and was later used for any word that was a homophone thereof. Now \uparrow and \uparrow are not found doubled.

Analysis of Table LXX.

The second sign is probably the gunu of the first.^{and different in meaning} Its context does not suggest a vowel modification of the latter.

Analysis of Table LXXI.

The first six signs are clearly all variants. The next three are variants of each other, and probably phonetic modifications of \triangle by the element \top . The last sign is probably the penultimate sign nasalized by adding the ' ' anusvar

Analysis of Table LXXII.

The last four signs are almost certainly variants of each other. They are probably a phonetic modification of the first: since when followed by \check{V} they alter its vowel to u. It is probable then that they are \rangle articulated with the vowel u or o.

Analysis of Table LXXIII.

The sequence P^{R} suggests that the first two signs in Col. IV may be variants. Since the first four signs are all initial and all represent birds (or a bird) they may all be variants. Regarding the next three no evidence is forthcoming from the sequences, except that the fifth and sixth are quasi-initial: and the seventh initial, though doubled. This would suggest that if indeed they are all variants they are to be read as ideograms. For since the dual is almost certain to be phonetically distinct from the singular its initial position as a phonogram would be coincidental, whereas if we read the sign ideographically it would be rational. An ideographic reading would also help to explain why, in a script so highly conventionalised, this sign has retained its pictographic aspect.

The last sign is probably ideographically independent - a duck in a pond.

Analysis of Table LXXIV.

The evidence of the key sequence V^{R} , $\text{E}^{\text{V}^{\text{R}}}$ (see Table LVIII) shows that all the signs in Col. IV are simple variants. The last two forms, which are reversed, occur only in reversed writing. The first (or third ?) form may be regarded as earliest, D as latest.

Analysis of Table LXXV.

The two signs in Col. IV may be phonetically allied. Of. Analysis of Table LVI, and cf. also Col. IV of Table LV.

Analysis of Table LXXVI.


It is possible that the two signs in Col. IV may be related.

Analysis of Tables LXXVII-LXXVIII.

It is interesting to note that though in text 2 of Table LXXVII the direction of the writing is reversed (left to right) the sign is not. Of. Table LVIII, 90, where the sign is reversed though the writing is not.

Similarly the third sign in Col. IV of Table LXXVIII is probably identical with the first two, in view of its initial position.

Analysis of Table LXXIX.

The second sign may be the first with the upper  lowered till it touch the lower. The third and fourth are probably variants of each other. The first two may be the dual of the second two.

Analysis of Table LXXX.

The first sign may be a variant of the second, or its modification by the addition of a short stroke.

Analysis of Table LXXXI.

Since the identity of the first three signs in Col. IV seems established by the sequence R^W , it is probable that the remainder, whose morphographic distinctions are very slight, are variants.

Analysis of Table LXXXII.

The two signs are clearly variants. A comparison of text 1 with 2, and 3 with 4, shows that the reversability of the sign is independent of the direction of the writing.

Analysis of Table LXXXIII.

The first two signs are variants. The reversal of the second is due to the reversal of the writing. The additional strokes in the third and fourth are probably of the gunn order and as elsewhere in this script (and often in Sumerian) may have no effect on the phonetic value of the sign.

Analysis of Table LXXXIV.

The first four signs in Col. IV are variants. Again reversability is seen to be immaterial. It is probable that the last two signs are variants of one another and represent the syllable 𒀭 modified by the vowel ū. It is curious though that 𒀭 can be followed by 𒄠 while 𒀭 is found with 𒄠

Analysis of Table LXXXV.

The ground for regarding these two signs as variants is mainly morphographic. The sequence "R is too common elsewhere to carry much weight.

Analysis of Table LXXXVI.

For a discussion of the second sign in Col. IV see Analysis of Table XXIX and LXIV.

Analysis of Table LXXXVII.

The first and second signs may be regarded as variants in view of the sequence RIII. And since the last closely resembles the first in appearance, and the third looks like a simplification of the second, the whole four may be regarded as variants.










Analysis of Table LXXXVIII.


NIL.

Analysis of Table LXXXIX.

The last four signs in Col. IV are clearly variants. Regarding the second no indication is obtainable from the sequences, but on morphographical grounds it can probably be classed as a variant. Regarding the first sign we are less certain.

Analysis of Table XC.

The first five signs in Col. IV appear to be variants. The base form is probably  (see the last sign in Col. IV) variously written  (see the third sign) and  ¹ (see the second sign). Later the internal strokes were omitted, and we get  as the base form (see the first, sixth and seventh and penultimate signs). These base forms are then modified by the vowel " = I (written in each half of the sign on the symmetrical principle) and the vowel u (also written in each half: the sixth sign is probably defective). These three phonetic varieties; the base form, articulated with a (text 23), the form with I (texts 1-12) and the form with u (texts 13-21) are also distinguished by their sequences, } R with the form in a;  with the form in I; R|| ,  R,  ,  R, with the form in u. I am at a loss to explain the penultimate form, with five strokes in each register, unless indeed it is indicative of some other vowel or diphthong. If so we must bear this in mind as a possible explanation of  and other signs containing more than three internal strokes. For there seems little doubt that this sign is related to the

1. or  (see the fifth sign, and the last sign but two).

preceding in view of their common sequence ΨR , initial. It can however hardly be regarded as a simple variant of it, if the number of internal strokes has any significance at all¹; and this, in the case of texts 1-12 and 13-21 seems clearly established from the evidence of the sequences. So then we may resume our argument by say, $\overline{\text{u}}$ differs from $\overline{\text{u}}$ in a manner we understand - viz. as other signs in $\overline{\text{u}}$ differ from their relatives in u , and $\overline{\text{u}}$ differs from both in a manner we at present do not understand, but assume to be phonetic.

Analysis of Table XCI.

The last two signs in Col. IV recall strongly certain phonetic variations of A , viz. A and A . Here also these additional strokes are clearly material, since the key sequences of the first sign ΨR , ΨR are not found with the last two signs. On the other hand two sequences ΨR and $\Psi \text{A} R$ are common to O and O . This is exactly parallel to what we saw regarding A and A , and we may draw the parallel conclusion - that O is a phonetic (vowel) modification of O . Now it is interesting to note that just as A is certainly distinct from, though allied to, A , so O is apparently distinct from O . Now we argued from the Brahmi (inter alia) that ' was probably Y and " I . It is to be inferred from the existence of A and O that the Proto-Indian script had a means of indicating \bar{e} as distinct from \bar{i} , and that that means was the lateral short stroke (as

1. Unless of course u was indicated in Proto-Indian by three or more short strokes: or, where there could be no confusion with \bar{i} , as in the form u , u even by two or more strokes. See Table LIII, Nos. 53-58. This suggests that the scribe was indifferent as to the number of strokes by which he indicated a given vowel, provided there could be no ambiguity. See also Table XV.

distinct from the perpendicular). This would be exactly parallel to the Brahmi method of indicating the vowel \bar{e} in open syllables. Here also as in Proto-Indian, the lateral strokes were not always horizontal but sometimes inclined,

Analysis of Table XCII.

The key sequences in this Table are RR, RR[̂], RA, R U, RR[̂]. These show that all the signs in Col. IV except the last and the first four are variants. The last is probably \square nasalized. Regarding the first four signs the sequences are silent. The first sign is probably independent. The next three may be variants of each other.

Analysis of Table XCIII.

The last sign is broken. Consequently we cannot be sure either of its full form or its relative position in the complete text. Possibly it may belong to the \square group in Table XCII.

Analysis of Table XCIV.

The last sign may be the first modified by ' = Y.

Analysis of Table XCV.

Probably variants. The sign looks like a compound of Y + \mathcal{R} but the latter element is nowhere found as an independent sign.



Analysis of Table XCVI.

The third sign is probably a graphic variant of the first. The second is probably a simplified and later form of the first. The last two may be \bar{u} or gunn forms of the second. The fourth sign is peculiar. The lines // may be a base for the three short strokes, like " in \mathcal{X}^f , ' in \mathcal{Y} , in which case \mathcal{Z} is probably \mathcal{Z} modified by the vowel \bar{u} .

Analysis of Table XCVII.

The two signs are clearly variants. The sign is ideographically distinct from those of the preceding Table. It is probably an insect: the strokes on the left being legs, those on the right being wings.

Analysis of Table XCVIII.

The first sign is probably the shield seen in  . The second sign is ideographically distinct. The third may be the second plus ' = , or a graphic variant. Or again it may be ideographically distinct.

Analysis of Table XCIX.

The sign in Col. IV, is probably a bird in flight: or perhaps a bat or 'flying-fox'.

Analysis of Table C.

NIL.

Analysis of Table CI.

The two signs are probably graphic variants. Perhaps the ideogram of a beetle.

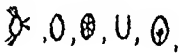
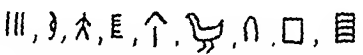






Analysis of Table CII.

NIL. This is a table of miscellaneous signs grouped here because they seem to have no connection with the signs of the other Tables.

SUMMARY. The analysis of the foregoing Tables enables us to recognize the vowels both independent and in composition. We also see which signs are simple variants. And we see which signs form regular groups and constitute words or phrases. We have identified the sign for 'God', 'to', 'from', 'son', .

'slave', and guessed at several more. We have established the connection between Brahmi and Proto-Indian, and shown grounds for inferring causal connections with Sumerian, Egyptian, Saba, Ethiopic, and Proto-Elamite. We may now explore these affinities with other scripts further in a Comparative Morphographic Table.

We have also shown that the script contains compound ideograms, and compound phonograms, and that the method of compounding is threefold - by bisection and enclosure, by simple enclosure, and by ligature (both vertical and lateral).

A word may now be said regarding cases where the same sign is repeated. The signs found repeated are , , and  (with its variants). If read phonetically we must assume that we have here cases of the repetition of the same syllable. Now to this there seems to be a marked objection in Proto-Indian on euphonic grounds (see Analysis of Table XIII). Another objection to a phonetic reading is the anomalies in sequence that this would produce, e.g. we should have to read  as initial, and it is never initial. It is probable then that these repetitions are to be read ideographically. This conclusion is supported by  which is clearly  written as a compound. Now the most naturally ideographic explanation of this repetition is to read them as the plural of the simple sign when they are repeated three times, as in the case with  and , and as the dual when only two come together, as is the case with the remainder. Of course it does not follow that a plural or dual meaning is necessarily implied. In many cases the word or syllable for which the doubled or trebled sign stands may be merely a homophone of the dual or plural of the sign.

The analysis of these Tables also puts us in a position to determine in what cases two or more succes

constitute a single word. There are many cases when at first sight one is tempted to consider as a single word signs which upon further analysis are seen to be separate words, their occurrence together being due to the fact that they form a single phrase or formula oft repeated: e.g. $\nabla \times$. Since we know that ∇ is suffixed to a very large number of signs there is no reason to suppose that it is other than a suffix in this case. In deciding that two or more signs form a single word I have rigidly observed the following principles: (1) that the combination is found in a number of cases relatively larger in proportion to the total occurrences of one of its members. (2) That the first member of the combination is demonstrably independent of any signs found preceding the combination, (3) that the last member is demonstrably independent of any signs found following the combination. Observing these principles we find that the following are probably single words. I say probably, since it is always possible that what we take for a single word may really be two separate words forming a common phrase or formula.

$\nabla V, \nabla P, III \psi, \nabla \psi, IIII \nabla, \nabla \nabla, \nabla \nabla$
(10)

variant spellings), \mathbb{A}^1 (2 variant spellings)

天甲, 山甲, 目甲, 凤甲, 夔甲, 人甲, 子甲.

V 占, V 占, 天 占, 天 占, 天 占, 天 占, 天 占, 天 占, 天 占, 天 占, 天 占
 (two variant spellings) 天 占, 天 占, 天 占, 天 占, 天 占 (one

(one variant spelling), $\uparrow\downarrow$, $\uparrow\downarrow$ } (three variant spellings),

[illegible]








3 𐎢, 𐎶 𐎢, 𐎠𐎶, 𐎶𐎠, 𐎢𐎠, 𐎢𐎢𐎢𐎢 𐎢, 𐎢𐎢𐎢 𐎢, 𐎢𐎢𐎢𐎢, 𐎢𐎢𐎢𐎢, 𐎢𐎢𐎢𐎢, 𐎢𐎢𐎢𐎢
 (one variant spelling).

On the other hand the following single signs can be shown to be separate words, since the signs found on either side of them (in the numbers cited) are known from other sequences

to be independent words:-

𐀡 (passim), 𐀢 (M.240), 𐀣 (H.77), 𐀤 (M.344), 𐀥 (Harappa passim), 𐀦 (H.163), 𐀧 (I.28), 𐀨 (M.78), 𐀩 (M.203),
𐀪 (passim), 𐀫 (M.227, 270 and passim), 𐀬 (M.297, and passim with antecedent numeral), 𐀭 (M.311), 𐀮 (I.30), 𐀯 (I.5, H.78, M.452), 𐀰 (M.334, H.180), 𐀱 (M.210), 𐀲 (M.184, H.96).

This group is very interesting showing how these sequences are built up with prefixes and suffixes. First we have the simple word 𐀢 then 𐀣 𐀢, then 𐀣 𐀢 𐀲, then 𐀣 𐀢 𐀲 𐀫 and finally 𐀣 𐀢 𐀲 𐀫 𐀫 - always in the same order), 𐀳 (M.375, 332, 313 etc.), 𐀴 (M.276, 83), 𐀵 (M.341, 179), 𐀶 (not found indisputably single, but its variant 𐀶' is so found, M.386), 𐀷 (I.27, M.271), 𐀸 (see "𐀸 passim), 𐀹 (see "𐀹 passim), 𐀺 (see "𐀺 passim), 𐀻 (M.116), 𐀼 (M.459), 𐀽 (M.69), 𐀾 (M.440), 𐀿 (M.433), 𐁀 (M.264), 𐁁 (H.22), 𐁂 (M.165), 𐁃 (M.356), 𐁄 (M.235), 𐁅 (M.461), 𐁆 (M.382), ' (passim), " (passim), "' (and all the numerals appear independently, see argument on numeral signs), '''' (I.35, M.279, 260), ''''' (M.76), | (M.272, 491), 𐁇 (passim), 𐁈 (M.196), 𐁉 (M.194),)) (M.215, 344), } (M.498),) (see all cases where it is preceded by a numeral sign), '𐀳' (M.257), 𐁊 (M.171), 𐁋 (M.38), 𐁌 (H.107), 𐁍 (H.209), 𐁎 (M.118), 𐁏 (H.239), 𐁐 (M.237, I.15, M.165), 𐁑 (M.235), 𐁒 (H.205), 𐁓 (and variants, H.28, 29, 238), 𐁔 (M.96), 𐁕 (M.7), 𐁖 (M.441), 𐁗 (M.499), 𐁘 (M.155), 𐁙 (M.63), 𐁚 (M.442), 𐁛 (H.33), 𐁜 etc. (M.2, 206, and passim), 𐁝 (passim), 𐁞 (H.73, M.169 and passim), 𐁟 (M.295), 𐁠 (M.41), 𐁡 (M.387), 𐁢 (M.261), 𐁣 (H.223), 𐁤 (M.250), 𐁥 (H.44), 𐁦 (M.179, etc.) 𐁧 (M.195), 𐁨 (passim), 𐁩 (H.143), 𐁪 (M.81), 𐁫 (M.209), 𐁬 (M.277), 𐁭 (M.173), 𐁮 (H.146), 𐁯 (H.178), 𐁰 (M.240), 𐁱 (M.167), 𐁲 (M.127), 𐁳 (M.72), 𐁴 (H.231 etc.), 𐁵 (M.80), 𐁶 (M.162), 𐁷 (M.18, 466, 36, 51, one variant spelling M.50), 𐁸 (M.363), 𐁹 (M.8), 𐁺 (M.492), 𐁻 (M.72),

 (M.452),  (M.182),  (M.263),  (M.266),  (M.417),
 (M.456),  (M.77).


It will be observed that no sign of common occurrence, except  is not found as a single word. If, as there is strong reason to suppose from the phonetic modifications of signs in accordance with principles of euphony, each sign constitutes a single sound or syllable, we have here evidence that a large number of words in our texts are monosyllables - i.e., unilateral or bilateral roots. And it must be remembered that in the above list of independent signs no account has been taken of compound ideograms, which may well also be monosyllabic, nor of a large number of simple ideograms which are probably independent, but where the evidence is not strong enough to give certitude. I conclude then that we are dealing in this script with a language which is pre-eminently monosyllabic, and in consequence that the language is not Sanskrit, or Semitic, whatever else it may be.

TABLE I

I	II	III	IV	I	II	III	IV
Nr	Text Nr	Text	Sign	Nr	Text Nr	Text	Sign
1	M. 107	R 天 T " 6	V	31	M. 480	R 尸 天	V
2	5	R O III III 天 " 天 " 天		32	M. 181	R 尸 天 " 0	
3	19	天 E R III 口 III		33	M. 187	R 尸 天 " 天	
4	24	R 尸	V	34	M. 123	R 尸 天 0 " 天	
5	503	R 尸		35	M. 184	R 尸 天 0 " 天 尸 天	
6	M. 133	R 尸 天		36	188	R 尸 天	
7	M. 204	R 尸 天 天 天 天		37	189	R 尸 天 天 " 天	
8	2	R 尸 天 0		38	190	R 尸 III 天 天 0 " 天	
9	M. 211	R 尸 天		39	244	R 尸	
10	41	R 尸 天 天		40	78	R 尸 天	
11	40	R 尸 天 天		41	M. 134	天 天 天 天 天 天 天 天 天 天	
12	26.27 M. 27.29	R 尸 天 天		42	M. 110	天 " R 尸 天 " 天	
13	26	R 尸 天 天		43	118	天 R 尸 天 天 " 天	
14	202	R 尸 天 " 天 天 天		44	243	R 尸 天	
15	201	R 尸 天 " 天		45	246	R 尸 天 " 天	
16	M. 38	R 尸 天		46	79	R 尸 天 天 天	
17	I. 26	天 天 天 R 尸 天 天		47	250	R 尸 天 天 天 天	
18	M. 203	R 尸 天 天 天		48	249	R 尸 天 天 天 天	
19	139	天 天 天 R 尸 天 天 天		49	M. 89	R 尸 天	
20	488	R 尸 天 天 天		50	M. 184	R 尸 天 天	
21	315	R 尸 天 天 天 天 天 天		51	89	天 天 天 R 尸 天 天	
22	M. 133	天 R 尸 天		52	M. 90	R 尸 天 天	
23	73	R 尸 天		53	M. 124	R 尸 天 天 " 天	
24	M. 101	R 尸 天 天 天 " 天 天		54	9	天 R 尸 天 天 天	
25	205	R 尸 天 " 天 " 天		55	303	R 尸 天 天 " 天 天 天	
26	204	R 尸 天 天 天		56	M. 109	R 尸 天 天 天 天 天	
27	I. 24	R 尸 天 天 天 天		57	M. 182	R 尸 天 天 天 天	
28	M. 76	R 尸 天 天		58	183	R 尸 天 天 天 天	
29	208	R 尸 III III 天 天 " 天 天		59	25	R 尸 天 天	
30	P. 1	R 尸 天		60	24	R 尸 天 III 天 天 天 " 天	
				60a	M. 195	天 R 尸 天	

TABLE I

I		II		III		IV		I		II		III		IV	
No.		Test No.		Test		No.		No.		Test No.		Test		No.	
61	M.	66		RY 占 0" 0		V		100	M.	72		R 兴 占 0" 0		V	
62	M.	192		RY 占 1/2				101		74		R 兴 占 0" 0			
63		195		RY 占 1 1/2				102		464		R 兴 1 0			
64		232		RY 占 1 1/2 3/4				103		173, 174		R 兴			
65	M.	105		RY 占 0				104		345		2 R 兴			
66		131		R 兴 占 0 兴 R Y 兴				105	M.	157		兴 R 兴			
67		1		R 兴 兴 R 兴				106	M.	156		R 兴 兴 R 兴			
68		70		R 兴 兴 兴 兴				107		344		兴 R 兴 R 兴			
69		233		R 兴 兴 兴 兴				108		374		兴 0 R 兴			
70		443		R 兴 兴 兴 兴				109		See Table 1, 2		兴 R 兴			
71		234		R 兴 兴 兴 兴				110	M.	6		R 兴			
72		442		R 兴 兴 兴 兴				111		177		R 兴 R 兴 兴 兴			
73		17		R 兴 兴 兴 兴				112		14		兴 R 兴 R 兴			
74		477		III R 兴 兴 兴 III				113		396		兴 R 兴 兴			
75		232		III R 兴 兴 兴 兴				114		33		R 兴 兴 0			
76		42		R 兴 兴 兴 兴				115		32		R 兴 兴 0			
77	M.	135		R 兴 兴 兴 兴				116	M.	95		R 兴 兴 兴			
78		71		R 兴 兴 兴 兴				117	M.	174		R 兴 兴 0			
79		443		R 兴 兴 兴 兴				118	M.	215		R 兴 兴 兴			
80		132		R 兴 兴 兴 兴				119	M.	175		R 兴 兴			
81	M.	352		R 兴 兴 兴 兴				120		178		R 兴 兴 兴 兴 兴 兴			
82		238		R 兴 兴 兴 兴				121	M.	208		R 兴 兴 兴 兴 兴 兴			
83		235		R 兴 兴 兴 兴				122	M.	220		R 兴 兴 兴 兴 兴 兴			
84		72		R 兴 兴 兴 兴				123	M.	189		R 兴 兴 兴 兴 兴 兴			
85		236		R 兴 兴 兴 兴				124	M.	42		R 兴 兴 兴 兴			
86	M.	133		R 兴 兴 兴 兴				125		481		R 兴 兴 兴 兴			
87		393		R 兴 兴 兴 兴				126		219		R 兴 兴 兴 兴 兴 兴			
88	M.	202		R 兴 兴 兴 兴				127		218		R 兴 兴 兴 兴 兴 兴			
89		220		R 兴 兴 兴 兴				128		344		R 兴 兴 兴 兴 兴 兴			
90				R 兴 兴 兴 兴				129		230		R 兴 兴 兴 兴 兴 兴			

TABLE I

I	II	III	IV	V	VI	VII	VIII
Nr	Nr	Nr	Nr	Nr	Nr	Nr	Nr
120	177 159	R X 田 英	V	148	177 159	R m m R 7 3	V
131	178 41	R X III W		151	193	11 田 田 m R E 0 V 7 00	
132	179 203	R X III V U		152	67	R A A A	
133	180 216	R X U		153	69	R m m . 0	
134	214	R X II 天 天 0 7 4		154	38	R 7 天 0	
135	215	R X 天 天 0 天 0		155	39	R 天 天 0	
136	179 93	R X 天 0		156	107	0 R 7	
137	179 217	R X 天 1		157	170	R 天 V 0	
138	179 218	R 天		158	171	R 天 天 m	
139	179 219	R 天		159	169	R 天 0	
140	210	R 天		160	170	R 天 天 m	
141	211	R 天 II		161	171	R 天 天 0	
142	212	R 天 天 0		162	172	R 天 天 0	
143	213	R 天 天 0		163	173	R 天 天 0	
144	214	R 天 天 0		164	174	R 天 天 0	
145	215	R 天 天 0		165	175	R 天 天 0	
146	216	R 天 天 0		166	176	R 天 天 0	
147	217	R 天 天 0		167	177	R 天 天 0	
148	218	R 天 天 0		168	178	R 天 天 0	
149	219	R 天 天 0		169	179	R 天 天 0	
150	220	R 天 天 0		170	180	R 天 天 0	
151	221	R 天 天 0		171	181	R 天 天 0	
152	222	R 天 天 0		172	182	R 天 天 0	
153	223	R 天 天 0		173	183	R 天 天 0	
154	224	R 天 天 0		174	184	R 天 天 0	
155	225	R 天 天 0		175	185	R 天 天 0	
156	226	R 天 天 0		176	186	R 天 天 0	
157	227	R 天 天 0		177	187	R 天 天 0	
158	228	R 天 天 0		178	188	R 天 天 0	
159	229	R 天 天 0		179	189	R 天 天 0	

TABLE I

I	II	III	IV	I	II	III	IV
№	Год	Год	№	№	Год	Год	№
310	н	211	РГГ" R	340	н	144	Р' 由口
311	н	221	RXIII V	341		88	н R 田 R
312		41	RXIII V	342	н	118	н R U 个 R
313	н	211	R IIII R	343	н	212	РГГ" R
314	н	255	R IIII R	344		240	E (R) UR
315		81	R IIII R	345	н	55, 56	田田 田田 R
316		257	R I I R	346		21	III R
317		125	R R R R	347		414	R R R R
318		242	R R R R	348	н	117	R R R R
319		155	R R R R	349		238	V R R R
320		516	R R R R	350		250	V R R R
321		77	R R R R	351		244	V R R R
322		87	R R R R	352		212	个 R R R
323		131	R R R R	353		241	V R R R
324		254	R R R R	354		240	V R R R
325		242	R R R R	355	н	196	R R R R
326		263	R R R R	356		249	V R R R
327		264	R R R R	357	н	291	Y R R R
328		451	R R R R	358		138	Y R R R
329	н	150	R R R R	359		241	V R R R
330		160	R R R R	360	н	214	R R R R
331		26	R R R R	361	н	403	R R R R
332	н	410	R R R R	362		181	V R R R
333		411	R R R R	363		193	V R R R
334	н	92	R R R R	364		193	V R R R
335	н	153	R R R R	365		447	R R R R
336		152	R R R R	366		496	R R R R
337		35	R R R R	367	н	163	V R R R
338	н	4	R R R R	368	н	213	V R R R
339	н	62	R R R R	369	н	401	R R R R

TABLE III

I	II	III	IV
Ref	Ref No	Text	Sign
1	M 113	W' R 3 E	U
2	137	Y R I	U
TABLE IV			
1	M 118	U M R O R	U
2	111	U M R 3 A	U
3	M 119	W' R 3 O	U
4	M 123	R O E V 7	U
5	M 108	X M R 3 T O V	U
6	77	V R 3	U
7	M 134	U M U V R 3 T O	U
8	M 215	V X 3 A M R O	U
9	M 220	V X R 3 B	U
10	201	V X R	U
11	M 71	V X 3 O 3 R	U
12	M 137	W 3 R I	U
13	M 84	W 3 R U	U
14	M 244	V R	U
15	M 214	U X 3 O T R	U
16	450	U A B U R 3 O	U
TABLE V			
1	M 114	3 R A	V
2	M 269	V R A 3 O	V
3	M 6	E V R A	V
4	I 14	H D H R O	V
5	M 236	V R M 3	V
6	I 29	Y M 3 R	V

TABLE VI

I	II	III	IV
Ref	Ref No	Text	Sign
1	M 120	V R 3 X	U
2	M 115, 116, 117	V R 3 A	U
3	24	V R	U
4	208	V R M 3 A 3 O 3 I A	U
5	M 159	3 I R	U
6	M 76	V R 3 X	U
7	M 41	V R A 3	U
8	211	V R A	U
9	I 24	W 3 A V R 3 X	U
10	M 2	V R M O	U
11	206	V R 3 X	U
12	203	V R U V 3	U
13	205	V R 3 3 O	U
14	207	V R 3 3 O 3 X 3 A 3 O	U
15	488	V R 3 X V H I	U
16	M 73	V R 3	U
17	P 1	V R 3	U
18	M 171	E V R 3	U
19	219, 230	E V R 3	U
20	M 8	E V R 3	U
21	228	E V R 3	U
22	I 24	V R V 3 V	U
23	M 201	V R 3 3 O	U
24	201	V R 3 3 Y 3 X 3	U
25	204	V R 3 3 X	U
26	265	V R 3 3 X 3 A 3 H	U
27	M 38	V R 3	U
28	133	V R 3	U
29	M 135	W 3 Y 3 X 3 O 3 M 3 R 3 W 3 A 3 X 3 X 3 O	U
30	503	V R	U

TABLE VII

I	C	□	□
53	M. 391	V 0 0 0 V R 11	U
54	I. 4	V T R " 0	
55	M. 390	R 0 0 0	
56	139	. 0 111 V V R " 11 11 0 0 0 0 0 0	
57	514	0 V 0 0 0 R 0	
58	M. 241	1 0 0 0 0 0 0 R 11	
59	M. 84	0 0 0 0 R	
60	115	1 0 0 R	
61	145	0 R	
62	I. 13	0 0 0 0 R 0	V
63	M. 221	V 11 R " 11	U
64	M. 449	" 0 0 V R 0	
65	143	1 0 0 0 R 11	
66	139	0 0 0 R 0	U
67	310	11 R " 0	U
68	M. 105	11 R 11 R	U
69	100	11 R	
		TABLE VIII	
1	M. 15	11 V 0 0 11 R	0 0
2	M. 233	V 11 11 11 R	
3	176	1111 R 0	
4	477	1111 R 11 0 V 11 11 11 11 0	
5	405	0 11 1111 R	
		TABLE IX	
1	M. 15	0 0 R	11
2	44	0 0 R	
3	M. 402	(0) R 11	11
4	509	11 R 0 0	

TABLE X

工	工	工	工	
日	日	日	日	
1	M	190	VUUR"O	①
2		186	VUR" 所 山 山	
3	M	135	UR" 山	
4	M	320	个 山 山 山	
5		136	个 山 山 山	
6	M	76	UR B	
7	M	131	UR 山	②
8		226	UR 山	
9		2	VUR	
10		114	UR 山	
11		215	VUR	
12		214	VUR 山 山 山 山 山 山	
13		515	个 山 山 山 山	
14	M	189	VUR 山 山 山 山 山 山	
15	M	271	山 山 山	
16	M	191	山 山	
17	M	270	山 山	③
18		18	山 山 山 山 山	
19		389	山 山 山 山 山	
20		172	VUR 山 山 山	
21		207	VUR 山 山 山 山 山	
22		227	VUR	
23		230	山 山 山 山 山 山 山 山 山 山	
24		431	山 山	
25		474	山 山 山	
26	I	15	山 山 山 山 山 山	
27	M	310	个 山 山 山 山 山 山	
28		431	山 山 山 山 山	
29		346	山 山 山	
30		317	个 山 山 山 山 山	

TABLE XIII

TABLE XII

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	m	3	V 110 R 1	17	1	11	11	11	11
2		4	V 0 111 R 1 1 1 1	18	2	12	12	12	12
3		311	1 1 1 1 1 R 1 1	19	3	13	13	13	13
4		111	V 1 1 1 1 1 1 1 1 1 1	20	4	14	14	14	14
5	1	35	1 1 1 1 1 1 1 1 1 1	21	5	15	15	15	15
6	m	11	1 1 1 1 1 1 1 1 1 1	22	6	16	16	16	16
7	m	111	1 1 1 1 1 1 1 1 1 1	23	7	17	17	17	17
8		111	1 1 1 1 1 1 1 1 1 1	24	8	18	18	18	18
9		121	1 1 1 1 1 1 1 1 1 1	25	9	19	19	19	19
10		311	1 1 1 1 1 1 1 1 1 1	26	10	20	20	20	20
11	1	111	1 1 1 1 1 1 1 1 1 1	27	11	21	21	21	21
12	111	111	1 1 1 1 1 1 1 1 1 1	28	12	22	22	22	22
13	m	111	1 1 1 1 1 1 1 1 1 1	29	13	23	23	23	23
14		111	1 1 1 1 1 1 1 1 1 1	30	14	24	24	24	24
15		211	1 1 1 1 1 1 1 1 1 1	31	15	25	25	25	25
16		111	1 1 1 1 1 1 1 1 1 1	32	16	26	26	26	26
17	m	111	1 1 1 1 1 1 1 1 1 1	33	17	27	27	27	27
18		121	1 1 1 1 1 1 1 1 1 1	34	18	28	28	28	28
19	m	311	1 1 1 1 1 1 1 1 1 1	35	19	29	29	29	29
20		311	1 1 1 1 1 1 1 1 1 1	36	20	30	30	30	30
21		311	1 1 1 1 1 1 1 1 1 1	37	21	31	31	31	31
22		311	1 1 1 1 1 1 1 1 1 1	38	22	32	32	32	32
23		311	1 1 1 1 1 1 1 1 1 1	39	23	33	33	33	33
24		511	1 1 1 1 1 1 1 1 1 1	40	24	34	34	34	34
25	1	11	1 1 1 1 1 1 1 1 1 1	41	25	35	35	35	35
26	m	111	1 1 1 1 1 1 1 1 1 1	42	26	36	36	36	36
27		211	1 1 1 1 1 1 1 1 1 1	43	27	37	37	37	37
28	m	111	1 1 1 1 1 1 1 1 1 1	44	28	38	38	38	38
29		311	1 1 1 1 1 1 1 1 1 1	45	29	39	39	39	39
30	1	311	1 1 1 1 1 1 1 1 1 1	46	30	40	40	40	40

TABLE XIII

TABLE XIII

I	II	III	IV	V	VI	VII	VIII
№	№	№	№	№	№	№	№
11	I 5	大 V R V 𐑖𐑦	𐑖	91	478	V 𐑖 R 𐑖	𐑖
12	II 75	𐑖 V R		91	I 3	V 𐑖 R 𐑖	
13	III 514	: 𐑖 𐑖 大 V R I		91	II. 393	大 V 𐑖 R 𐑖	
14	78	V 𐑖 R I		94	452	V 𐑖 R 𐑖	
15	106	III R V		95	129	I R 𐑖	
16	103	V 𐑖 𐑖 V 𐑖 R		96	4	𐑖 𐑖 R	
17	194	V 𐑖 𐑖 R 𐑖 𐑖 𐑖		97	58	V 𐑖 R	
18	167	V 𐑖 𐑖 R 𐑖 R 𐑖		98	157	V 𐑖 R	
19	206	V V 𐑖 R 𐑖		99	158	V 𐑖 R 𐑖	
20	219	V (R) 𐑖		100	63	𐑖 R 𐑖 𐑖	
21	13	(𐑖 R)		101	49	𐑖 III R	
22	100	(𐑖 R)		102	340	𐑖 𐑖 V 𐑖 R	
23	365	V V 𐑖 R 𐑖 𐑖 R H		103	I 19	𐑖 𐑖 R 𐑖	
24	354	𐑖 𐑖 R 𐑖 𐑖 𐑖		104	II 402	V 𐑖 R 𐑖 𐑖	
25	366	𐑖 R 𐑖		105	I 36	𐑖 R 𐑖	
26	II 68	𐑖 V 𐑖 H. 𐑖 R V I		106	II 370	𐑖 R 𐑖 𐑖	
27	I 17	V 𐑖 𐑖 R 𐑖		107	371	𐑖 R 𐑖	
28	II 47-49	V 𐑖 𐑖 R 𐑖		108	372	𐑖 R 𐑖 𐑖	
29	I 29	V 𐑖 R 𐑖		109	373	𐑖 R 𐑖 𐑖	
30	26	𐑖 𐑖 V V R 𐑖		110	374	𐑖 R 𐑖 𐑖	
31	II 167	R 𐑖 𐑖 𐑖		111	II 152	𐑖 R 𐑖	
32	211	V 𐑖 R 𐑖		112	I 6	V 𐑖 R 𐑖	
33	95	V 𐑖 R 𐑖		113	II 180	𐑖 𐑖 R 𐑖	
34	I 2	R 𐑖		114	II 104	𐑖 𐑖 R 𐑖	
35	II 172	R 𐑖		115	II 107	V 𐑖 R 𐑖 𐑖	
36	186	𐑖 R 𐑖 𐑖		116	II 374	𐑖 III 𐑖 R 𐑖	
37	I 1	𐑖 R 𐑖 𐑖		117	229	V 𐑖 R 𐑖	
38	II 4	V 𐑖 R		118	152	𐑖 III 𐑖 R 𐑖	
39	93	V 𐑖 R		119	327	𐑖 R 𐑖	
40	225	V 𐑖 R 𐑖 𐑖 𐑖		120	433	V 𐑖 R 𐑖	

TABLE XIII

TABLE XIII

I	L. S.	□	□	I	C	□	□
Ref.	Test No.	Test	Sign.	Ref.	Test No.	Test	Sign.
111	n 139	V U U "A" 4 R 2 2 "0	A	151	n 340	E 4 R 0	A
112	507	1 4 R 2		152	325	4 R	
113	n 123	Y 4 R 2 (153	324	4 R	
114	133	V 4 R 0 "0		154	401	V 2 2 2 R	
115	n 33	V 4 R 0		155	315	V U 2 2 2 R 4 H	
116	121	2 4 R 0		156	238	V 2 2 R V 2)	
117	474	10 4 R		157	460	V 4 2 R "0	
118	478	V U 2 R V H		158	467	4 3 3 2 2 R "0	
119	42	V 2 2 2 R		159	256	V 2 2 2 2 R	
120	256	V 2 2 2 R 2		160	474	10 4 R 2	
121	119	4 R 0		161	121	2 4 R 2 0	
122	n 91	V 2 R		162	109	2 4 R 0)) 2 4 R 2 0	
123	n 501	E 4 2 R 2		163	76	V U 2 2 R	
124	n 129	Y 4 4 2 R 2 0 "0		164	80	V 2 R 2 2 2	
125	n 156	V 2 R V 2		165	16	Y 2 2 2 2 2 2 2 2 2	
126	L 36	4 2 R		166	n 73	V 2 R 2 2 "0	
127	n 155	V 2 R 2 2 2 2 2		167	235	4 V 2 R 2	
128	103	4 2 2 2 2 R "0		168	62	Y 2 R 2 V 2 2 2	
129	331	4 3 3 3 2 R 2 2 2 2		169	467	2 R 2	
130	347	E 4 3 3 R		170	n 178	2 4 R 2	
131	450	4 3 3 3 R 2 2 2		171	113	2 4 R 2 2	
132	335	4 3 3 3 R 2 2 " 2 2 2		172	240	E (R) U V	
133	190	V 2 2 2 2 R 0 "0	A	173	n 465	2 2 2 R	
134	186	V 2 2 R 0 " 2 2 2 2		174	388	2 V R 2	
135	39	V 2 R 0		175	n 380	4 R R	
136	38	V 2 R 0		176	226	V 2 2 2 R " 2 2	
137	33	V 2 R 0		177	424	2 R " 2 2 U	
138	210	V 2 R		178	446	V 2 R " 0	
139	302	Y 4 V 2 R 0 2 2		179	252	V 2 O R 2	
140	n 213	V 2 2 R 0 "Y 2 2		179a	369	1 R 2 2 2 2	

TABLE XIII

TABLE XIII

1	2	3	4	5	6	7	8
№	№	№	№	№	№	№	№
100	1.73	181	336	102	2.08	182	336
101	336	103	95	104	77	105	4
102	2.08	106	45	107	97	108	184
103	95	109	184	110	30	111	124
104	77	112	89	113	303	114	43-46
105	4	115	75	116	467	117	308
106	45	118	159, 160	119	475	120	378
107	97	121	378	122	378	123	371
108	184	124	214	125	314	126	400
109	30	127	101	128	101	129	261
110	124	130	261	131	95	132	403
111	303	133	403	134	127	135	261
112	89	136	261	137	127	138	261
113	303	139	261	140	127	141	261
114	43-46	142	261	143	127	144	261
115	75	145	261	146	127	147	261
116	467	148	261	149	127	150	261
117	308	151	261	152	127	153	261
118	159, 160	154	261	155	127	156	261
119	475	157	261	158	127	159	261
120	378	160	261	161	127	162	261
121	378	163	261	164	127	165	261
122	371	166	261	167	127	168	261
123	371	169	261	170	127	171	261
124	214	172	261	173	127	174	261
125	314	175	261	176	127	177	261
126	400	178	261	179	127	180	261
127	101	181	261	182	127	183	261
128	101	184	261	185	127	186	261
129	101	187	261	188	127	189	261
130	101	190	261	191	127	192	261
131	101	193	261	194	127	195	261
132	101	196	261	197	127	198	261
133	101	199	261	200	127	201	261
134	101	202	261	203	127	204	261
135	101	205	261	206	127	207	261
136	101	208	261	209	127	210	261
137	101	211	261	212	127	213	261
138	101	214	261	215	127	216	261
139	101	217	261	218	127	219	261
140	101	220	261	221	127	222	261
141	101	223	261	224	127	225	261
142	101	226	261	227	127	228	261
143	101	229	261	230	127	231	261
144	101	232	261	233	127	234	261
145	101	235	261	236	127	237	261
146	101	238	261	239	127	240	261
147	101	241	261	242	127	243	261
148	101	244	261	245	127	246	261
149	101	247	261	248	127	249	261
150	101	250	261	251	127	252	261
151	101	253	261	254	127	255	261
152	101	256	261	257	127	258	261
153	101	259	261	260	127	261	261

TABLE XIII

TABLE XIII

I	E	□	IV	I	O	□	IV
Nr	Text Nr	Text	Sign	Nr	Text Nr	Text	Sign
241	M 430	V Δ R Δ "0	Δ	211	M 17	III V * T R III	
242	461	V Δ R Δ		212	245	□ V □ R	
243	M 127	Y Δ R Δ		213	M 7	E V □ R	
244	M 507	/ Δ R		214	67	E V □ R	
245	161	V Δ R Δ R V Y Δ		215	15	E V □ R Y Δ	
246	231	V Δ R II	Δ	216	74	V □ R Y Δ	
247	484	IR: V //	Δ	217	75	V Δ □ R	
248	406	0): R: Δ	Δ	218	159	V Δ □ R	
249	363	Δ R Δ II Δ R Δ	Δ	219	40	V V Δ R	
250	375	Δ R "0		220	41	V V Δ R	
251	326	Δ R V Δ Δ		221	M 481	V Δ R: Δ Δ Δ	
252	491	Δ R V Δ		222	M 176	Δ Δ R	
253	M 43	Δ R Y		223	M 236	V * R Δ	
254	M 469	Δ R Δ II " Δ		224	M 163	V * R V Δ	
255	332	Δ III V Δ R Δ II Δ		225	209	V Y Δ R V Y Δ	
256	418	/ Δ R Δ: Δ		226	M 500	V Δ R "0	
257	279	Δ III R Δ II "0		227	306	Y Δ V Δ Δ R "0	Δ
258	165	V Δ R Δ II "0		228	M 93	V Δ R "0	Δ
259	M 119	Δ R Δ R Δ R I O		229	M 217	V Δ R I	
260	M 62	Y Δ R Δ R V III Δ		230	M 38	V V R	
261	235	Δ V * Δ R		231	M 200	V V R Δ Δ	
262	457	Δ R		232	187	V V R "0 I	
263	M 178	Δ R		233	207	V V Δ Δ R "0 Δ T Δ	
264	M 485	III Δ R " Δ		234	486	Δ Δ R "0	
265	388	Δ V Δ R		235	M 184	Δ Δ R "0	
266	318	Δ R V Δ		236	187	V Δ R "0	
267	317	Δ R Δ "0		237	M 367	R Δ Δ Δ	
268	74	V Δ Δ Δ R Δ "0		238	213	Δ Δ Δ R Δ	
269	335	Δ III V Δ R " Δ Δ		239	305	Y Δ R Δ "0	
270	313	Δ R Y R		240	50	Y Δ R Δ	

TABLE XIII

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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TABLE XIV

	15	TABLE XX
1	3 40	國 RV 國 7 4
2	2 13	國 RV 國 7 4
3	12	國 RV 國 7 4
4	25	國 RV 國 7 4
5	22 2	國 RV 國 7 4
6	36 6	國 RV 國 7 4
7	353	國 RV 國 7 4

TABLE XV

1	M	296
2		270
3	M	234
4	M	273
5		274
6	R	234
7	M	281

TABLE XV

№	Time	□	□	□
465		R 2 "0		床
466		R Y 0 "0		
110		R Y 0 "0		
276		R 2 "0		
47		R 2 "0		
196		R 2 "0		
222		R 2 "0		
226		R 2 "0		
P		R 2 "0		
M	472	R 2 "0		
I	10	R 2 "0		
M	273	R 2 "0		
I	8	R 2 "0		
M	278	R 2 "0		
M	80	R 2 "0		
	48	R 2 "0		
	106	R 2 "0		
	164	R 2 "0		
	225	R 2 "0		
M	189	R 2 "0		
M	191	R 2 "0		
	168	R 2 "0		
I	1	R 2 "0		
M	282	R 2 "0		
M	146	R 2 "0		
	34	R 2 "0		
M	277	R 2 "0		
	275	R 2 "0		
	131	R 2 "0		
	272	R 2 "0		

TABLE XX

TABLE XXI

I	II	III	IV	I	II	III	IV
MS	700-1 MS	700-1	6-90	MS	700-1 MS	700-1	6-90
33	M 280	R 1' 4 III U	部	13	M 1	U X R U 1/3	441
34	M 128	R 田 Δ	部	14	471	III 90 10 U X R U 16 田	
40	158	R 2 U 1/3	部	15	70	U X R U 1/3	
41	M 84	R 2 U 1/3	部	16	461	U X R 00 田 8 "0	
42	M 137	R 2 U 1/3	部	17	234	U X R 2 "0	
43	134	III 大 E R 0 Δ	部	18	232	X 9 U X R 1/3 U	
44	M 85	R 0 Δ "0	部	19	17	III U X R X III	
45	M 104	R 0 A	部	20	M 74	0 III R	
46	92	U R 0 A	部	21	M 371	1 A' R	
47	X 16	R 0 A U 0 A X	部	22	94	Y 田 X R 00 1	
48	M 211	R 0 白	部	23	M 95	E U X R 00	
49	351	E R 00 Δ	部	24	M 419	0 X R 00 U 1 00	
50	M 3675	E R 1 01	部	25	X 25	4 00 U 00 X R 00 1 8	
51	105	E R 1 01	部	26	M 5	U 0 III 0 X R 00 "0	
52	M 476	III 00 R	部	27	64	U 1 0 U 00 U X R 00 "0	
				28	229	0 III 0 X R "0	
				29	223	0 III 0 X R	
				30	M 128	0 X R	
				31	124	0 X R	
				32	141	0 X R	
				33	M 114	0 X R 2	
				34	216	0 X R 0 0 "0	
				35	264	U 0 X R "0 X	
				36	I 15	0 X R Δ	
				37	M 108	X 1/3 U X R 0 U	
				38	I 34	0 1/3 X R 0	
				39	M 215	0 X R 1/3 0	
				40	M 134	U 1/3 X R 0	
				41	M 497	R	
				42	154	R	

TABLE XXV

I	II	III	IV
MS	700-1 MS	700-1	6-90
1	M 412	U R U	441
2	467	III R "0	
3	M 43	0 X R	
4	235	1/3 X R 0	
5	232	U 1 0 U 00 X R 0	
6	M 214	U 1 0 U 00 X R 0 "0 1/3	
7	212	0 X R X	
8	238	0 1/3 X R	
9	126	1 0 0 X R	
10	233	U X R "0 III 00	
11	463	U X R "0 1/3	
12	107	U X R "0 *	

TABLE XVI

TABLE XVIII

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525</
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TABLE XIX

Y	U	□	□
Nr	Text-Nr	Text	Sign
25	M 365	U U 3 R 2 A H	
26	362	U 2 R 2	
27	150	'R 2 2	
28	404	R	
29	341	X H 2 R 2	
30	510	H R Y III	
TABLE XX			
1	H 171	/ R \	
2	M 391	R	
3	404	R	
TABLE XXI			
1	M 303	U Y R 2 2 2 2	
2	H 90	U Y R 2	
3	M 184	U Y R 2	
4	89	Y III U Y R 2	
5	124	U Y R 2 2	
6	185	U Y R 2	
7	9	E U Y R 2 2	
8	H 14	E U Y R 2 2	
9	96	E U Y R 2 2	
10	97	E U Y R 2 2	
11	194	E U Y R	
12	M 181	U Y R II U 2	
13	182	U Y R II U 2	
14	240	U Y R II U 2	
15	64	U Y R II U 2 2 2 2	
16	66	U Y R 2 2	

TABLE XXII

I	II	III	IV
Nr	Text-Nr	Text	Sign
17	M 183	U Y R U 2 2	
18	H 192	U Y R U 2	
19	195	U Y R U 2 2	
20	209	U Y R 2 U Y 2	
21	210	U Y R II U 2 2 2	
22	232	U Y R 2 2 2 2 2 2	
23	89	U Y R	
24	M 410	III U Y R	
25	466	U Y R 2 2	
26	H 110	U Y R U 2 2	
27	M 91	Y III U Y R	
28	260	U A III U Y R	
29	326	U Y R U 2	
30	463	U Y R U 2	
31	I. 13	U Y R U 2	
32	H 40	U Y R U 2	
33	165	U Y R U 2	
34	138	U Y R U 2	
35	M 435	U Y R U 2	
36	H 116	U Y R U 2	
37	M 154	U Y R U 2	
38	386	U Y R U 2	
39	511	U Y R U 2	
40	H 25, 36	U Y R U 2	
41	169	U Y R U 2	
42	120	U Y R U 2	
43	M 58, 55	U Y R U 2	
44	57	U Y R U 2	
45	115	U Y R U 2	
46	449	U Y R U 2	

TABLE XXX

TABLE XXX

I	II	III	IV	I	II	III	IV
No.	Ref. No.	Text	Ref.	No.	Ref. No.	Text	Ref.
47	2 31	⊗ R 0 1 2	白	1	11 458	V 2 30	◇
48	27	R 2 4 4		2	12 37	V R 0	
49	154	⊗ R 0 1 2		3	15 151	⊗ R 0 1 2	
50	155	R 1 1 1 1		4	16 2	1 1 R 0 1	
51	162	R 1 1 1 1 1 1		5	17 11	1 1 R 0	
52	163	⊗ R 0 1 2		6	18 213	V V R	
53	271	⊗ R 0		7	22 223	V 1 1 1 V 2 R	
54	207	V V 1 1 1 1 1 1 R Te		8	23 31	1 1 V 1 1 1 1 R 2 0	
55	164	V I R I	由	9	24 165	1 1 1 1 1 1 R 0	
TABLE XXX				10	25 166	1 R 0 0	
1	2 4	V R 0 1 2	甲	11	26 171	⊗ R 0 0	
2	1 211	V 1 1 1 1 R 0 0		12	27 1	V 1 1 1 1 R 2 4	
TABLE XXX				13	28 15	⊗ R 0	
1	1 111	⊗ R 0	中	14	29 16	Y 1 1 1 R 1 1 1 1 1 1	
2	1 151	V 1 1 1 1 1 1 1		15	30 17	Y 1 1 1 R	
3	1 151	V 1 1 1 1 1 1 1		16	31 285	Y 1 1 1 R	
4	1 151	V 1 1 1 1 1 1 1		17	32 506	⊗ R 0 1 R	
5	1 151	R R V 1 1 1 1 1 1		18	33 5	V 0 1 1 1 1 1 1 R	
6	1 200	⊗ R 0 1 1 1 1 1	中	19	34 161	V 1 1 1 1 1 1 1 1 1 1 R	
7	1 151	Y 1 1 1 1 1 1 R	中	20	35 193	V 1 1 1 1 1 1 1 1 1 1 R	
8	1 151	Y 1 1 1 1 1 1 1 1 1 1 R	中	21	36 121	V Y 0 1 1 1 R	
				22	37 201	V V 1 1 R	
				23	38 378	1 1 1 1 1 1 R	
				24	39 422	⊗ V 1 1 R	
				25	40 306	⊗ V 1 1 1 1 1 1 R	
				26	41 476	T 1 1 1 R	
				27	42 187	V 1 1 1 R	

TABLE XXIV

TABLE XXIV

I	II	III	IV	V	VI	VII	VIII
No.	Text	Text	Sign	No.	Text	Text	Sign
31	H 95	V A X " R	◇	61	M 163	V A X " R A	○
32	M 446	V B X " R		62	M 169	今 III " R	○
33	479	V C X " R		63	M 103	与 C III " R	
34	180	V D X " R		64	467	今 III " R	
35	297	V E X " R		65	M 180	与 C X " R	
36	I 20	V F X " R		66	M 375	与 C X " R	
37	M 190	V G X " R		67	500	V H X " R	
38	M 123	V I X " R		68	M 93	V J X " R	
39	A 305	V K X " R		69	M 452	田 今 X " R	
40	262	V L X " R		70	I 3	III C X " R	
41	291	响 A " R		71	M 182	响 A " R	
42	329	今 III " R		72	181	V F X " R	
43	450	今 III " R		73	189	响 A X " R	
44	M 114	I " R		74	223	V A X " R	
45	46	R " 占 *		75	M 452	V X " R	
46	M 197	Y III " R	◇	76	83	V H " R	
47	54	占 R A V X	◇	77	81	V III A " R	
48	447	R C 占 V X	◇	78	269	V W A " R	
49	162	R V V C X	◇	79	101	田田 A " R	
50	M 167	△ 今 " R	◇	80	176	响 A " R	
51	M 167	V A X " R	○	81	196	V A " R	
52	305	III V " R		82	205	V U " R	
53	321	今 A " R		83	277	响 A " R	
54	267	Y III " R		84	304	Y A V " R	
55	421	Y III " R		85	312	Y A " R	
56	202	Y III " R		86	216	今 A " R	
57	294	Y III " R		87	413	△ " R	
58	323	今 A " R		88	420	响 A " R	
59	212	V III " R		89	447	V A " R	
60	331	今 III " R		90	487	响 A " R	

TABLE XXX

TABLE XXXI

2	2	=	2	2	=	2
2	2	2	2	2	2	2
1	21	0.000 R V 5 0 7 00	31	207	Y R 0	1.1
2	210	Y R	32	212	Y R 0 6	
3	214	[U R R	33	216	Y R 0	
4	217	U R R	34	219	Y R 0 0	
5	222	U R R	35	222	Y R 0	
6	223	U R R	36	225	Y R 0	
7	224	U R R	37	227	Y R 0	
8	225	U R R	38	228	Y R 0	
9	226	U R R	39	229	Y R 0	
10	227	U R R	40	230	Y R 0	
11	228	U R R	41	231	Y R 0	
12	229	U R R	42	232	Y R 0	
13	230	U R R	43	233	Y R 0	
14	231	U R R	44	234	Y R 0	
15	232	U R R	45	235	Y R 0	
16	233	U R R	46	236	Y R 0	
17	234	U R R	47	237	Y R 0	
18	235	U R R	48	238	Y R 0	
19	236	U R R	49	239	Y R 0	
20	237	U R R	50	240	Y R 0	
21	238	U R R	51	241	Y R 0	
22	239	U R R	52	242	Y R 0	
23	240	U R R	53	243	Y R 0	
24	241	U R R	54	244	Y R 0	
25	242	U R R	55	245	Y R 0	
26	243	U R R	56	246	Y R 0	
27	244	U R R	57	247	Y R 0	
28	245	U R R	58	248	Y R 0	
29	246	U R R	59	249	Y R 0	
30	247	U R R	60	250	Y R 0	
31	248	U R R	61	251	Y R 0	
32	249	U R R	62	252	Y R 0	
33	250	U R R	63	253	Y R 0	
34	251	U R R	64	254	Y R 0	
35	252	U R R	65	255	Y R 0	
36	253	U R R	66	256	Y R 0	
37	254	U R R	67	257	Y R 0	
38	255	U R R	68	258	Y R 0	
39	256	U R R	69	259	Y R 0	
40	257	U R R	70	260	Y R 0	
41	258	U R R	71	261	Y R 0	
42	259	U R R	72	262	Y R 0	
43	260	U R R	73	263	Y R 0	
44	261	U R R	74	264	Y R 0	
45	262	U R R	75	265	Y R 0	
46	263	U R R	76	266	Y R 0	
47	264	U R R	77	267	Y R 0	
48	265	U R R	78	268	Y R 0	
49	266	U R R	79	269	Y R 0	
50	267	U R R	80	270	Y R 0	
51	268	U R R	81	271	Y R 0	
52	269	U R R	82	272	Y R 0	
53	270	U R R	83	273	Y R 0	
54	271	U R R	84	274	Y R 0	
55	272	U R R	85	275	Y R 0	
56	273	U R R	86	276	Y R 0	
57	274	U R R	87	277	Y R 0	
58	275	U R R	88	278	Y R 0	
59	276	U R R	89	279	Y R 0	
60	277	U R R	90	280	Y R 0	
61	278	U R R	91	281	Y R 0	
62	279	U R R	92	282	Y R 0	
63	280	U R R	93	283	Y R 0	
64	281	U R R	94	284	Y R 0	
65	282	U R R	95	285	Y R 0	
66	283	U R R	96	286	Y R 0	
67	284	U R R	97	287	Y R 0	
68	285	U R R	98	288	Y R 0	
69	286	U R R	99	289	Y R 0	
70	287	U R R	100	290	Y R 0	

TABLE XXX

TABLE XXX

I	U	II	I	U	II
42	700 401	700 401	42	700 401	700 401
11	103	103	31	103	103
12	104	104	32	104	104
13	105	105	33	105	105
14	106	106	34	106	106
15	107	107	35	107	107
16	108	108	36	108	108
17	109	109	37	109	109
18	110	110	38	110	110
19	111	111	39	111	111
20	112	112	40	112	112
21	113	113	41	113	113
22	114	114	42	114	114
23	115	115	43	115	115
24	116	116	44	116	116
25	117	117	45	117	117
26	118	118	46	118	118
27	119	119	47	119	119
28	120	120	48	120	120
29	121	121	49	121	121
30	122	122	50	122	122
31	123	123	51	123	123
32	124	124	52	124	124
33	125	125	53	125	125
34	126	126	54	126	126
35	127	127	55	127	127
36	128	128	56	128	128
37	129	129	57	129	129
38	130	130	58	130	130
39	131	131	59	131	131
40	132	132	60	132	132
41	133	133	61	133	133
42	134	134	62	134	134
43	135	135	63	135	135
44	136	136	64	136	136
45	137	137	65	137	137
46	138	138	66	138	138
47	139	139	67	139	139
48	140	140	68	140	140
49	141	141	69	141	141
50	142	142	70	142	142
51	143	143	71	143	143
52	144	144	72	144	144
53	145	145	73	145	145
54	146	146	74	146	146
55	147	147	75	147	147
56	148	148	76	148	148
57	149	149	77	149	149
58	150	150	78	150	150
59	151	151	79	151	151
60	152	152	80	152	152
61	153	153	81	153	153
62	154	154	82	154	154
63	155	155	83	155	155
64	156	156	84	156	156
65	157	157	85	157	157
66	158	158	86	158	158
67	159	159	87	159	159
68	160	160	88	160	160
69	161	161	89	161	161
70	162	162	90	162	162
71	163	163	91	163	163
72	164	164	92	164	164
73	165	165	93	165	165
74	166	166	94	166	166
75	167	167	95	167	167
76	168	168	96	168	168
77	169	169	97	169	169
78	170	170	98	170	170
79	171	171	99	171	171
80	172	172	100	172	172

TABLE XXXI

TABLE XXXIV

I	C	□	□	I	□	□	□
NS	Text NS	Text	Sign	NS	Text NS	Text	Sign
121	Z 25	Y R 2 U ◊	1111 1111	11	I 10	Y R 11 12 13 14	111 1111 1111
TABLE XXXII				TABLE XXXV			
1	M 150	U R 11 12 13 14	11	1	M 254	U R	111 1111 1111
2	M 511	1111 12 13 14 15 16		2	76	U R 2	
TABLE XXXIII				TABLE XXXVI			
1	M 11	U R 11 12 13 14	11	1	M 61	X R.	1111
2	475	U R 11 12 13 14		2	M 477	R 11 12 13 14	
3	120	(U R 11 12 13 14)	11	3	476	R 11 12 13 14	1111
4	I 9	U R 11 12 13 14		4	405	U R 11 12 13 14	
5	M 37	U R 11 12 13 14	11	5	233	U R 11 12 13 14	1111
6	M 215, 475	U R 11 12 13 14		6	21	R 11 12 13 14	
7	312	U R 11 12 13 14	11	7	M 15	R 11 12 13 14	1111
8	133	U R 11 12 13 14		8	M 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	U R	
9	405	U R 11 12 13 14	1111	9	M 3, 4, 16	R 11 12 13 14	1111
		U R 11 12 13 14		10	163	R 11 12 13 14	
TABLE XXXVII				TABLE XXXIX			
1	M 15	U R 11 12 13 14	1111	11	163	R 11 12 13 14	1111
2	Z 35	U R 11 12 13 14		12	M 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	U R	
3	M 382	U R 11 12 13 14	1111	13	M 111	U R 11 12 13 14	1111
4	256	U R 11 12 13 14		14	112	U R 11 12 13 14	
5	511	U R 11 12 13 14	1111	15	112	U R 11 12 13 14	1111
6	275	U R 11 12 13 14		16	112	U R 11 12 13 14	
7	260	U R 11 12 13 14	1111	17	215	U R 11 12 13 14	1111
8	80	U R 11 12 13 14		18	164	U R 11 12 13 14	
9	330	U R 11 12 13 14	1111			U R 11 12 13 14	1111
10	331	U R 11 12 13 14				U R 11 12 13 14	

TABLE XXXVII

TABLE XXXVIII

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8
1	177	U R U R U R U R	1	30	211	V R R R	1
2	119	U R U R U R U R		31	212	U R U R U R U R	
3	110	U R U R U R U R		32	213	E R R R	
4	217	V R R R		33	169	U R R R	
5	219	U R R R U R R R		34	213	U R R R	
6	317	U R R R		35	174	U R R R	
7	79	U R R R U R R R		36	183	U R R R U R R R	
8	212	U R R R		37	217	U R R R	
9	212	U R R R		38	303	U R R R	
10	212	U R R R		39	331	U R R R U R R R	
11	212	U R R R		40	328	U R R R	
12	212	U R R R		41	318	U R R R	
13	212	U R R R		42	187	U R R R	
14	112	U R R R U R R R		43	175	U R R R	
15	110	U R R R		44	155	U R R R	
16	126	U R R R		45	123	U R R R	
17	60	U R R R U R R R					
18	212	U R R R					
19	212	U R R R					
20	212	U R R R					
21	212	U R R R					
22	511	U R R R					
23	512	U R R R					
24	127	U R R R					
25	117	U R R R					
26	512	U R R R					
27	212	U R R R					
28	319	U R R R					
29	119	U R R R					

TABLE XL

TABLE XL

ニ	ニ	ニ	ニ	ニ	ニ	ニ	ニ
ニ	ニ	ニ	ニ	ニ	ニ	ニ	ニ
1	1	1	1	1	1	1	1
2	191	1	1	1	1	1	1
3	195	1	1	1	1	1	1
4	203	1	1	1	1	1	1
5	221	1	1	1	1	1	1
6	222	1	1	1	1	1	1
7	177	1	1	1	1	1	1
8	311	1	1	1	1	1	1
9	344	1	1	1	1	1	1
10	455	1	1	1	1	1	1
11	158	1	1	1	1	1	1
12	175	1	1	1	1	1	1
13	32	1	1	1	1	1	1
14	265	1	1	1	1	1	1
15	401	1	1	1	1	1	1
16	74	1	1	1	1	1	1
17	453	1	1	1	1	1	1
18	225	1	1	1	1	1	1
19	120	1	1	1	1	1	1
20	158	1	1	1	1	1	1
21	400	1	1	1	1	1	1
22	193	1	1	1	1	1	1
23	114	1	1	1	1	1	1
24	504	1	1	1	1	1	1
25	133	1	1	1	1	1	1
26	102	1	1	1	1	1	1
27	117	1	1	1	1	1	1
28	434	1	1	1	1	1	1
29	126	1	1	1	1	1	1
30	215	1	1	1	1	1	1
31	114	1	1	1	1	1	1
32	103	1	1	1	1	1	1
33	200	1	1	1	1	1	1
34	35	1	1	1	1	1	1
35	455	1	1	1	1	1	1
36	194	1	1	1	1	1	1
37	70	1	1	1	1	1	1
38	334	1	1	1	1	1	1
39	377	1	1	1	1	1	1
40	105	1	1	1	1	1	1
41	442	1	1	1	1	1	1
42	236	1	1	1	1	1	1
43	13	1	1	1	1	1	1
44		1	1	1	1	1	1

ニ	ニ	ニ	ニ	ニ	ニ	ニ	ニ
ニ	ニ	ニ	ニ	ニ	ニ	ニ	ニ
1	1	1	1	1	1	1	1
2	304	1	1	1	1	1	1
3	31	1	1	1	1	1	1
4	175	1	1	1	1	1	1
5	435	1	1	1	1	1	1
6	196	1	1	1	1	1	1
7	198	1	1	1	1	1	1
8	193	1	1	1	1	1	1
9	170	1	1	1	1	1	1
10	265	1	1	1	1	1	1
11	175	1	1	1	1	1	1
12	75	1	1	1	1	1	1
13	47	1	1	1	1	1	1

TABLE XLIV

1	2	3	4
1	2	3	4
1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8
6	7	8	9
7	8	9	10
8	9	10	11
9	10	11	12
10	11	12	13
11	12	13	14
12	13	14	15
13	14	15	16
14	15	16	17
15	16	17	18
16	17	18	19
17	18	19	20
18	19	20	21
19	20	21	22
20	21	22	23
21	22	23	24
22	23	24	25
23	24	25	26
24	25	26	27
25	26	27	28
26	27	28	29
27	28	29	30
28	29	30	31
29	30	31	32
30	31	32	33
31	32	33	34
32	33	34	35
33	34	35	36
34	35	36	37
35	36	37	38
36	37	38	39
37	38	39	40
38	39	40	41
39	40	41	42
40	41	42	43
41	42	43	44
42	43	44	45
43	44	45	46
44	45	46	47
45	46	47	48
46	47	48	49
47	48	49	50
48	49	50	51
49	50	51	52
50	51	52	53
51	52	53	54
52	53	54	55
53	54	55	56
54	55	56	57
55	56	57	58
56	57	58	59
57	58	59	60
58	59	60	61
59	60	61	62
60	61	62	63
61	62	63	64
62	63	64	65
63	64	65	66
64	65	66	67
65	66	67	68
66	67	68	69
67	68	69	70
68	69	70	71
69	70	71	72
70	71	72	73
71	72	73	74
72	73	74	75
73	74	75	76
74	75	76	77
75	76	77	78
76	77	78	79
77	78	79	80
78	79	80	81
79	80	81	82
80	81	82	83
81	82	83	84
82	83	84	85
83	84	85	86
84	85	86	87
85	86	87	88
86	87	88	89
87	88	89	90
88	89	90	91
89	90	91	92
90	91	92	93
91	92	93	94
92	93	94	95
93	94	95	96
94	95	96	97
95	96	97	98
96	97	98	99
97	98	99	100

TABLE XLV

1	2	3	4
1	2	3	4
1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8
6	7	8	9
7	8	9	10
8	9	10	11
9	10	11	12
10	11	12	13
11	12	13	14
12	13	14	15
13	14	15	16
14	15	16	17
15	16	17	18
16	17	18	19
17	18	19	20
18	19	20	21
19	20	21	22
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21	22	23	24
22	23	24	25
23	24	25	26
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25	26	27	28
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34	35	36	37
35	36	37	38
36	37	38	39
37	38	39	40
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39	40	41	42
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41	42	43	44
42	43	44	45
43	44	45	46
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45	46	47	48
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47	48	49	50
48	49	50	51
49	50	51	52
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58	59	60	61
59	60	61	62
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61	62	63	64
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63	64	65	66
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67	68	69	70
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70	71	72	73
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73	74	75	76
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75	76	77	78
76	77	78	79
77	78	79	80
78	79	80	81
79	80	81	82
80	81	82	83
81	82	83	84
82	83	84	85
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85	86	87	88
86	87	88	89
87	88	89	90
88	89	90	91
89	90	91	92
90	91	92	93
91	92	93	94
92	93	94	95
93	94	95	96
94	95	96	97
95	96	97	98
96	97	98	99
97	98	99	100

TABLE XLIX

TABLE XLVIII

I	II	III	IV	V	VI	VII	VIII	IX	X
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950
951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970
971	972	973	974	975	976	977	978	979	980
981	982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999	1000

TABLE L

TABLE L			TABLE L1		
S	II	III	IV	V	VI
Ref	Text No	Text	Sign	Ref	Text
1	1	VR 44 V1)	✱	31	M 72
2	232	(9 VR 44 V1)		32	73
3	234	VR 44 8"0		33	74
4	235	VR 44 8"0		34	M 152
5	236	VR 44 8"0		35	M 7
6	237	VR 44 8"0			
7	238	VR 44 8"0			
8	239	VR 44 8"0			
9	240	VR 44 8"0			
10	241	VR 44 8"0			
11	242	VR 44 8"0			
12	243	VR 44 8"0			
13	244	VR 44 8"0			
14	245	VR 44 8"0			
15	246	VR 44 8"0			
16	247	VR 44 8"0			
17	248	VR 44 8"0			
18	249	VR 44 8"0			
19	250	VR 44 8"0			
20	251	VR 44 8"0			
21	252	VR 44 8"0			
22	253	VR 44 8"0			
23	254	VR 44 8"0			
24	255	VR 44 8"0			
25	256	VR 44 8"0			
26	257	VR 44 8"0			
27	258	VR 44 8"0			
28	259	VR 44 8"0			
29	260	VR 44 8"0			
30	261	VR 44 8"0			
31	262	VR 44 8"0			
32	263	VR 44 8"0			
33	264	VR 44 8"0			
34	265	VR 44 8"0			
35	266	VR 44 8"0			
36	267	VR 44 8"0			
37	268	VR 44 8"0			
38	269	VR 44 8"0			
39	270	VR 44 8"0			
40	271	VR 44 8"0			
41	272	VR 44 8"0			
42	273	VR 44 8"0			
43	274	VR 44 8"0			
44	275	VR 44 8"0			
45	276	VR 44 8"0			
46	277	VR 44 8"0			
47	278	VR 44 8"0			
48	279	VR 44 8"0			
49	280	VR 44 8"0			
50	281	VR 44 8"0			
51	282	VR 44 8"0			
52	283	VR 44 8"0			
53	284	VR 44 8"0			
54	285	VR 44 8"0			
55	286	VR 44 8"0			
56	287	VR 44 8"0			
57	288	VR 44 8"0			
58	289	VR 44 8"0			
59	290	VR 44 8"0			
60	291	VR 44 8"0			
61	292	VR 44 8"0			
62	293	VR 44 8"0			
63	294	VR 44 8"0			
64	295	VR 44 8"0			
65	296	VR 44 8"0			
66	297	VR 44 8"0			
67	298	VR 44 8"0			
68	299	VR 44 8"0			
69	300	VR 44 8"0			
70	301	VR 44 8"0			
71	302	VR 44 8"0			
72	303	VR 44 8"0			
73	304	VR 44 8"0			
74	305	VR 44 8"0			
75	306	VR 44 8"0			
76	307	VR 44 8"0			
77	308	VR 44 8"0			
78	309	VR 44 8"0			
79	310	VR 44 8"0			
80	311	VR 44 8"0			
81	312	VR 44 8"0			
82	313	VR 44 8"0			

TABLE LIII

[illegible]

TABLE LIV

	TABLE LV	SECRET
100	U R 2 7 9 2	
101	U R 2	
102	U R 2	
103	U R 2	
104	U R 2	
105	U R 2	
106	U R 2	
107	U R 2	
108	U R 2	
109	U R 2	
110	U R 2	
111	U R 2	
112	U R 2	
113	U R 2	
114	U R 2	
115	U R 2	
116	U R 2	
117	U R 2	
118	U R 2	
119	U R 2	
120	U R 2	
121	U R 2	
122	U R 2	
123	U R 2	
124	U R 2	
125	U R 2	
126	U R 2	
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129	U R 2	
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147	U R 2	
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157	U R 2	
158	U R 2	
159	U R 2	
160	U R 2	
161	U R 2	
162	U R 2	
163	U R 2	
164	U R 2	
165	U R 2	
166	U R 2	
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171	U R 2	
172	U R 2	
173	U R 2	
174	U R 2	
175	U R 2	
176	U R 2	
177	U R 2	
178	U R 2	
179	U R 2	
180	U R 2	
181	U R 2	
182	U R 2	
183	U R 2	
184	U R 2	
185	U R 2	
186	U R 2	
187	U R 2	
188	U R 2	
189	U R 2	
190	U R 2	
191	U R 2	
192	U R 2	
193	U R 2	
194	U R 2	
195	U R 2	
196	U R 2	
197	U R 2	
198	U R 2	
199	U R 2	
200	U R 2	

TABLE LVI

TABLE LVIII

I	II	III	IV	V	VI	VII	VIII
№	№	№	№	№	№	№	№
1	155	VU 20 7 2 4	H	1	25	obverse	E
2	156	VU 2 2 2 2 2 2	H	2	36	R 2	
3	157	2 2 2 2 2 2	H	3	101	R 101	
4	158	2 2 2 2 2 2	H	4	102	R 102	
5	159	RD 11 10	H	5	4	R 4	
6	252	V 1 0 2 1 2 2 2 2 2 2	H	6	25	R 25	
7	160	2 2 2 2 2 2	H	7	66	R 66	
8	161	V 2 2 2 2 2 2	H	8	71	R 71	
9	162	2 2 2 2 2 2	H	9	152	R 152	
10	163	[V 1 1 1 1 1 1 1 1 1 1]	H	10	153, 154	R 153, 154	
11	164	2 2 2 2 2 2	H	11	6	R 6	
12	165	2 2 2 2 2 2	H	12	9	R 9	
13	166	2 2 2 2 2 2	H	13	15, 16, 17	R 15, 16, 17	
14	167	2 2 2 2 2 2	H	14	13	R 13	
15	168	V 2 2 2 2 2 2	H	15	61, 62, 63	R 61, 62, 63	
16	169	2 2 2 2 2 2	H	16	72	R 72	
17	170	2 2 2 2 2 2	H	17	1	R 1	
18	171	2 2 2 2 2 2	H	18	11	R 11	
19	172	2 2 2 2 2 2	H	19	17	R 17	
20	173	2 2 2 2 2 2	H	20	20	R 20	
21	174	2 2 2 2 2 2	H	21	3	R 3	
22	175	2 2 2 2 2 2	H	22	16	R 16	
23	176	2 2 2 2 2 2	H	23	102	R 102	
24	177	2 2 2 2 2 2	H	24	15	R 15	
25	178	2 2 2 2 2 2	H	25	6	R 6	
26	179	2 2 2 2 2 2	H	26	7	R 7	
27	180	2 2 2 2 2 2	H	27	15	R 15	
28	181	2 2 2 2 2 2	H	28	67	R 67	
29	182	2 2 2 2 2 2	H	29	14	R 14	

TABLE LVII

2 2 2 2 2 2

R

2 2 2 2

TABLE LVII

1	2	3	4
10	20	30	40
10	20	VII	R V ~
20	30	VI	R V III A
30	40	IV	R V III
40	50	VII	R V II
50	60	IV	R V
60	70		R V V
70	80		R V V
80	90		R V V
90	100		R V V
100	110		R V V
110	120		R V V
120	130		R V V
130	140		R V V
140	150		R V V
150	160		R V V
160	170		R V V
170	180		R V V
180	190		R V V
190	200		R V V
200	210		R V V
210	220		R V V
220	230		R V V
230	240		R V V
240	250		R V V
250	260		R V V
260	270		R V V
270	280		R V V
280	290		R V V
290	300		R V V
300	310		R V V
310	320		R V V
320	330		R V V
330	340		R V V
340	350		R V V
350	360		R V V
360	370		R V V
370	380		R V V
380	390		R V V
390	400		R V V
400	410		R V V
410	420		R V V
420	430		R V V
430	440		R V V
440	450		R V V
450	460		R V V
460	470		R V V
470	480		R V V
480	490		R V V
490	500		R V V
500	510		R V V
510	520		R V V
520	530		R V V
530	540		R V V
540	550		R V V
550	560		R V V
560	570		R V V
570	580		R V V
580	590		R V V
590	600		R V V
600	610		R V V
610	620		R V V
620	630		R V V
630	640		R V V
640	650		R V V
650	660		R V V
660	670		R V V
670	680		R V V
680	690		R V V
690	700		R V V
700	710		R V V
710	720		R V V
720	730		R V V
730	740		R V V
740	750		R V V
750	760		R V V
760	770		R V V
770	780		R V V
780	790		R V V
790	800		R V V
800	810		R V V
810	820		R V V
820	830		R V V
830	840		R V V
840	850		R V V
850	860		R V V
860	870		R V V
870	880		R V V
880	890		R V V
890	900		R V V
900	910		R V V
910	920		R V V
920	930		R V V
930	940		R V V
940	950		R V V
950	960		R V V
960	970		R V V
970	980		R V V
980	990		R V V
990	1000		R V V

TABLE LVIII

1	2	3	4
10	20	30	40
10	20	VII	R V ~
20	30	VI	R V III A
30	40	IV	R V III
40	50	VII	R V II
50	60	IV	R V
60	70		R V V
70	80		R V V
80	90		R V V
90	100		R V V
100	110		R V V
110	120		R V V
120	130		R V V
130	140		R V V
140	150		R V V
150	160		R V V
160	170		R V V
170	180		R V V
180	190		R V V
190	200		R V V
200	210		R V V
210	220		R V V
220	230		R V V
230	240		R V V
240	250		R V V
250	260		R V V
260	270		R V V
270	280		R V V
280	290		R V V
290	300		R V V
300	310		R V V
310	320		R V V
320	330		R V V
330	340		R V V
340	350		R V V
350	360		R V V
360	370		R V V
370	380		R V V
380	390		R V V
390	400		R V V
400	410		R V V
410	420		R V V
420	430		R V V
430	440		R V V
440	450		R V V
450	460		R V V
460	470		R V V
470	480		R V V
480	490		R V V
490	500		R V V
500	510		R V V
510	520		R V V
520	530		R V V
530	540		R V V
540	550		R V V
550	560		R V V
560	570		R V V
570	580		R V V
580	590		R V V
590	600		R V V
600	610		R V V
610	620		R V V
620	630		R V V
630	640		R V V
640	650		R V V
650	660		R V V
660	670		R V V
670	680		R V V
680	690		R V V
690	700		R V V
700	710		R V V
710	720		R V V
720	730		R V V
730	740		R V V
740	750		R V V
750	760		R V V
760	770		R V V
770	780		R V V
780	790		R V V
790	800		R V V
800	810		R V V
810	820		R V V
820	830		R V V
830	840		R V V
840	850		R V V
850	860		R V V
860	870		R V V
870	880		R V V
880	890		R V V
890	900		R V V
900	910		R V V
910	920		R V V
920	930		R V V
930	940		R V V
940	950		R V V
950	960		R V V
960	970		R V V
970	980		R V V
980	990		R V V
990	1000		R V V

TABLE LXI

TABLE LXIII

I	C	□	□	I	C	□	□
Ref	Text	Text	Sign	Ref	Text	Text	Sign
18	m	307	Y@EIR}	14	m	124	E自山太DND/R
19	k	51	R)	15	k	439	自山W R
20	m	339	. R 招 抄	16	k	443	V* R'''
21	l	203	0) 英 R 2	17	m	152	V* R'''
22	332	今山W 英 R 2	18	m	254	E V* R'''	
23	k	50	R) 6 .	19	22	411 R*	
24	I	5	大V 2 V Q R	20	145	R 0/	
25	m	500	RT R 1111 R	21	264	V@ 2 T'' R	
				22	295	Y''' R	
				23	306	1@ R V > * > 0 交 " 0	
				24	27	自 R 0	
				25	390	V R 0	
				26	393	VE R'''	
				27	511	2 1111 10 10 10 10	
				28	456	0 111 H) R 0 4	
				29	492	V 2 英 " 10 11) R	
				30	18	◇ R 0 " 0 11	
				31	m	389	7 ◇ R 0
				32	372	10 11) R 4	
				33	509	10 11	
				34	154	2 2 R 10 1	
				35	161	V 2 2 2 2 2 V 1 R	
				36	126	10 R 2 4	
				37	144	R	
				38	512	21 R	
				39	241	2 H 11 11 11 R	
				40	444	V R " V 1) 1	
				41	34	E 2 R 11	

TABLE LXII

1	I	14	H R 11 W ◇	D	390	W R 11
2	H	15	0 R 0 幸	8	391	W R 1111
3	m	215	V 11 0 2 (4) R 0 11	8	511	2 11 11 11 R 0 11 10 2
4	H	44	2 2 R *	256	256	2 11 11 11 R 0 2
5	H	151	2 R 0 4 1 2 " 0	202	202	V A 2 11 11 11 11 R
6	H	31	E R 0 4	18	18	◇ R 0 " 11 11
7		30	E R 0	385	385	2 11 11 11 11
8	m	450	今 11 R 0 V " ◇	372	372	2 11 11 11 11 R 4
9	H	125	18 R 2	505	505	2 11 11 11 11
10		76	V 0 R	154	154	2 11 11 11 11 R 11
11		150	V R 11 11 11	161	161	V 11 11 11 11 11 V 11 R
				126	126	1 11 R 2 11
				142	142	R
				512	512	2 11 R
				221	221	2 11 11 11 11 R
				442	442	V R 11 11 11 11
				34	34	E 2 11 R 11

TABLE LXIV

TABLE LXV

[illegible]

TABLE LXVIII

TABLE LXVIII				Tone		Sign	
No.	Year	Month	Day	Hour	Minute	Second	Sign
1	100	1	1	1	1	1	↑
2	101	2	2	2	2	2	↑
3	102	3	3	3	3	3	↑
4	103	4	4	4	4	4	↑
5	104	5	5	5	5	5	↑
6	105	6	6	6	6	6	↑
7	106	7	7	7	7	7	↑
8	107	8	8	8	8	8	↑
9	108	9	9	9	9	9	↑
10	109	10	10	10	10	10	↑
11	110	11	11	11	11	11	↑
12	111	12	12	12	12	12	↑
13	112	13	13	13	13	13	↑
14	113	14	14	14	14	14	↑
15	114	15	15	15	15	15	↑
16	115	16	16	16	16	16	↑
17	116	17	17	17	17	17	↑
18	117	18	18	18	18	18	↑
19	118	19	19	19	19	19	↑
20	119	20	20	20	20	20	↑
21	120	21	21	21	21	21	↑
22	121	22	22	22	22	22	↑
23	122	23	23	23	23	23	↑
24	123	24	24	24	24	24	↑
25	124	25	25	25	25	25	↑
26	125	26	26	26	26	26	↑
27	126	27	27	27	27	27	↑
28	127	28	28	28	28	28	↑
29	128	29	29	29	29	29	↑
30	129	30	30	30	30	30	↑
31	130	31	31	31	31	31	↑
32	131	32	32	32	32	32	↑
33	132	33	33	33	33	33	↑
34	133	34	34	34	34	34	↑
35	134	35	35	35	35	35	↑
36	135	36	36	36	36	36	↑
37	136	37	37	37	37	37	↑
38	137	38	38	38	38	38	↑
39	138	39	39	39	39	39	↑
40	139	40	40	40	40	40	↑
41	140	41	41	41	41	41	↑
42	141	42	42	42	42	42	↑
43	142	43	43	43	43	43	↑
44	143	44	44	44	44	44	↑
45	144	45	45	45	45	45	↑
46	145	46	46	46	46	46	↑
47	146	47	47	47	47	47	↑
48	147	48	48	48	48	48	↑
49	148	49	49	49	49	49	↑
50	149	50	50	50	50	50	↑
51	150	51	51	51	51	51	↑
52	151	52	52	52	52	52	↑
53	152	53	53	53	53	53	↑
54	153	54	54	54	54	54	↑
55	154	55	55	55	55	55	↑
56	155	56	56	56	56	56	↑
57	156	57	57	57	57	57	↑
58	157	58	58	58	58	58	↑
59	158	59	59	59	59	59	↑
60	159	60	60	60	60	60	↑

TABLE LXVIII

I	II	III	IV
№	Table №	Table	Sign
11	335	R III 0 8 8 " 品 8 0 II	↑
12	337	R III 0 8 8 " 0	
13	336	R III 0 8 8 " 0	
14	334	R III 0 8 8 " 0	
15	330	R III 0 8 8 " 0	
16	335	XX 0 0 III R	↑
TABLE LXIX			
1	316	0 8 8 " 0	
2	312	V R R " 8 V	
3	318	0 8 8 " 0	
4	313	V 0 R	
TABLE LXX			
1	311	0 8 8 " 0	△
2	316	V R R " 8 V	
3	313	V V R 8 8	
4	317	8 R 0 " 8 II	
5	318	0 8 8 " 0	

TABLE LXXI

I	II	III	IV
№	Table №	Table	Sign
1	314	8 V R	A
2	314	8 V R	
3	314	8 V R	
4	314	V III R " 0	
5	314	V V R	
6	314	V R	A
7	314	8 V R	
8	314	V R R V I	
9	314	8 V R	
10	314	V V R " 8 " 0 / A	
11	314	V R R	A
12	314	V R 8 8 " 0	
13	314	V V R	
14	314	V R	
15	314	V V R	
16	314	V R	A
17	314	V V R	
18	314	V R " 0	
19	314	Y R V " 0	
20	314	8 V R	
21	314	V V 8 8 " 8 R 0	T
22	314	V 8 8 8 " 8 R 0	
23	314	R 8 8 " 0	
24	314	R " 0	
25	314	R " 0	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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TABLE LXXIV

1	2	3	4
1	175	VRI	
2	314	VVR	
3	61	R 1111	
4	71	EVR (with variants of E)	
5	100	See Table LXXIII	
6	101	VVR	
7	102	VVR	
8	103	RVI	
9	104	RVE	
10	105	RVE	

TABLE LXXV

1) V.R
 2) V.R
 3) Y.V.R.P
 4) Y.V.R.P

TABLE LXXVI

1) R
 2) R

TABLE LXXVII

1	2	3	4
1	175	EVR	
2	314	R 1111	
3	61	EVR (with variants of E)	
4	71	See Table LXXIII	
5	100	VVR	
6	101	VVR	
7	102	RVI	
8	103	RVE	
9	104	RVE	

TABLE LXXVIII

1) R
 2) R
 3) R

TABLE LXXIX

1) R
 2) R
 3) R

TABLE LXXX

1) R
 2) R

TABLE 1. CONTINUED

1	2			
3	4	5	6	7
8	9	10	11	12
13	14	15	16	17
18	19	20	21	22
23	24	25	26	27
28	29	30	31	32
33	34	35	36	37
38	39	40	41	42
43	44	45	46	47
48	49	50	51	52
53	54	55	56	57
58	59	60	61	62
63	64	65	66	67
68	69	70	71	72
73	74	75	76	77
78	79	80	81	82
83	84	85	86	87
88	89	90	91	92
93	94	95	96	97
98	99	100	101	102
103	104	105	106	107
108	109	110	111	112
113	114	115	116	117
118	119	120	121	122
123	124	125	126	127
128	129	130	131	132
133	134	135	136	137
138	139	140	141	142
143	144	145	146	147
148	149	150	151	152
153	154	155	156	157
158	159	160	161	162
163	164	165	166	167
168	169	170	171	172
173	174	175	176	177
178	179	180	181	182
183	184	185	186	187
188	189	190	191	192
193	194	195	196	197
198	199	200	201	202
203	204	205	206	207
208	209	210	211	212
213	214	215	216	217
218	219	220	221	222
223	224	225	226	227
228	229	230	231	232
233	234	235	236	237
238	239	240	241	242
243	244	245	246	247
248	249	250	251	252
253	254	255	256	257
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263	264	265	266	267
268	269	270	271	272
273	274	275	276	277
278	279	280	281	282
283	284	285	286	287
288	289	290	291	292
293	294	295	296	297
298	299	300	301	302
303	304	305	306	307
308	309	310	311	312
313	314	315	316	317
318	319	320	321	322
323	324	325	326	327
328	329	330	331	332
333	334	335	336	337
338	339	340	341	342
343	344	345	346	347
348	349	350	351	352
353	354	355	356	357
358	359	360	361	362
363	364	365	366	367
368	369	370	371	372
373	374	375	376	377
378	379	380	381	382
383	384	385	386	387
388	389	390	391	392
393	394	395	396	397
398	399	400	401	402

71011 4 10000

1	2	3	4
1	1	VIRRE	1
2	2	VH 150	2
3	3	X 1000	3
4	4	IVV 1	4
5	5	IVV 1	5
6	6	IVV 1	6
7	7	IVV 1	7
8	8	IVV 1	8
9	9	IVV 1	9
10	10	IVV 1	10
11	11	IVV 1	11
12	12	IVV 1	12
13	13	IVV 1	13
14	14	IVV 1	14
15	15	IVV 1	15
16	16	IVV 1	16
17	17	IVV 1	17
18	18	IVV 1	18
19	19	IVV 1	19
20	20	IVV 1	20
21	21	IVV 1	21
22	22	IVV 1	22
23	23	IVV 1	23
24	24	IVV 1	24
25	25	IVV 1	25
26	26	IVV 1	26
27	27	IVV 1	27
28	28	IVV 1	28
29	29	IVV 1	29
30	30	IVV 1	30
31	31	IVV 1	31
32	32	IVV 1	32
33	33	IVV 1	33
34	34	IVV 1	34
35	35	IVV 1	35
36	36	IVV 1	36
37	37	IVV 1	37
38	38	IVV 1	38
39	39	IVV 1	39
40	40	IVV 1	40
41	41	IVV 1	41
42	42	IVV 1	42
43	43	IVV 1	43
44	44	IVV 1	44
45	45	IVV 1	45
46	46	IVV 1	46
47	47	IVV 1	47
48	48	IVV 1	48
49	49	IVV 1	49
50	50	IVV 1	50
51	51	IVV 1	51
52	52	IVV 1	52
53	53	IVV 1	53
54	54	IVV 1	54
55	55	IVV 1	55
56	56	IVV 1	56
57	57	IVV 1	57
58	58	IVV 1	58
59	59	IVV 1	59
60	60	IVV 1	60
61	61	IVV 1	61
62	62	IVV 1	62
63	63	IVV 1	63
64	64	IVV 1	64
65	65	IVV 1	65
66	66	IVV 1	66
67	67	IVV 1	67
68	68	IVV 1	68
69	69	IVV 1	69
70	70	IVV 1	70
71	71	IVV 1	71
72	72	IVV 1	72
73	73	IVV 1	73
74	74	IVV 1	74
75	75	IVV 1	75
76	76	IVV 1	76
77	77	IVV 1	77
78	78	IVV 1	78
79	79	IVV 1	79
80	80	IVV 1	80
81	81	IVV 1	81
82	82	IVV 1	82
83	83	IVV 1	83
84	84	IVV 1	84
85	85	IVV 1	85
86	86	IVV 1	86
87	87	IVV 1	87
88	88	IVV 1	88
89	89	IVV 1	89
90	90	IVV 1	90
91	91	IVV 1	91
92	92	IVV 1	92
93	93	IVV 1	93
94	94	IVV 1	94
95	95	IVV 1	95
96	96	IVV 1	96
97	97	IVV 1	97
98	98	IVV 1	98
99	99	IVV 1	99
100	100	IVV 1	100

TABLE XC

TABLE XCI

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8
1	433	U R	U R	22	H 88	U R H	(1)
2	390	U R	U R	23	57	U R	
3	27	U R	U R	24	53	U R E V	
21	339	U R	U R	25	47	U R	
23	113	U R	U R	26	117	U R	
				27	H 477	U R	
				28	466	U R	
				29	342	U R	
				30	37	U R	
				31	36	U R	
				32	51	U R	
				33	305	U R	
				34	62	U R	
				35	503	U R	
				36	H 66	U R	
				37	34	U R	
				38	93	U R	
				39	93	U R	
				40	7	U R	
				41	43-46	U R	
				42	50	U R	
				43	306	U R	
				44	23	U R	

TABLE XCVII

TABLE XCV

TABLE XCV				TABLE XCVII				TABLE XCVIII				TABLE XCIX				TABLE C			
I	C	Test	Sign	I	C	Test	Sign	I	C	Test	Sign	I	C	Test	Sign	I	C	Test	Sign
1	M	363		1	M	401		1	M	266		1	M	204		1	M	354	
2		202		2	L	10		2	M	190		2	L	31		2		202	
3		470		3	M	249	3	M	249	3			408						
4		247		4		209	4		209	4			266						
5		408		5		352	5		352										
6		221																	
7		331																	
TABLE XCV				TABLE XCVI				TABLE XCIX				TABLE C							
1	M	407		1	M	253		1	M	354		1	M	354					
2		252		2	M	60		2		202		2		202					
3		264		3		114		3		408		3		408					
			4		102	4			266	4			266						
			5		102	5				5									
			6		102	6				6									
			7		102	7				7									

M O H E N J O D A R O.

TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
1	E. 444	30	VS. 3500	60	L. 461
2	Hr. 165	31	VS. 2590	61	Sd. 1200
3	DK. 210	32	VS. 2613	62	Hr. 115
4	Hr. 1651	33	Hr. 2743	63	
5	¹	34	VS. 888	64	
6	Hr. 3259	35	VS. 56 (2)	65	O. 2056
7	DK. 2732	36	Sd. 2554	66	Hr. 1121
8	Hr. 3766	37	DK. 1994	67	L. 702
9	Hr. 4805	38	Sd. 1517	68	VS. 208
10	L. 515	39	VS. 2360	69	D. 150
11		40	VS. 983	70	Hr. 3689
12	Hr. 3388	41	VS. 2028	71	Hr. 1575
13		42	DK. 1578	72	Hr. 1050
14	C. 696	43	DK. 1606	73	Hr. 4285
15	Hr. 1056	44	L. 459	74	Hr. 2023
16	Hr. 4275	45	VS. 2109	75	Sd. 818
17	Hr. 5971	46	Sd. 1758	76	D. 114
18	Hr. 1443	47	Hr. 2676	77	D. 262
19	Hr. 2289	48	Hr. 4337	78	D. 263
20	Sd. 1923	49	Sd. 2051	79	E. 1095
21	VS. 1026	50	Hr. 5816	80	Hr. 4237
22	Hr. 5616	51	Hr. 2822	81	DK. 1291
23	DK. 634	52	VS. 1104	83	VS. 2100
24.	VS. 192	53	Hr. 4573	84	Hr. 4109
25	Hr. 723	54	VS. 2432	85	
26	Hr. 4337	55	Hr. 2924	86	D. 288
27	VS. 3320	56	VS. 1959	87	Hr. 6216
28	L. 456	57	Hr. 4615	88	DK. 597
29	VS. 1988	58	Hr. 4799	89	G. 217

1. Some objects had not been registered at the time of the writer's visit.

TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
184		215	Hr. 3730	247	DK. 12
185	E. 523	216	DK. 2363	248	Sd. 570
186	DK. 3054	217	Hr. 2883	249	Hr. 2582
187	Hr. 4385	218	DK. 2220	250	DK. 3279
188		219		251	Hr. 4436
189	E. 1521	220	Hr. 1575	252	Hr. 4519
190	VS. 1779	221	Sd. 1553	253	Hr. 4411
191	L. 742	222	E. 345	254	L. 899
192	Hr. 4400	223	E. 1154	255	Hr. 3732
193	Hr. 4492	224	Hr. 99	256	Hr. 2522
194	VS. 1468	225	"stupa"	257	D. 316
195		226	Hr. 4356	258	DK. 1541
196	Hr. 2863	227	VS. 2374	259	E. 976
197	Hr. 1804	228	Hr. 5594	260	VS. 3546
198	C. 2072	229	DK. 92	261	Hr. 4054
199		230	C. 2691	262	E. 1345
200	DK. 596	231	Hr. 5788	263	Hr. 2596
201	E. 829	232	VS. 3359	264	
202	C. 3070	233	Hr. 5085	265	Hr. 5772
203	DK. 2971	234	Hr. 4601	266	
204	D. 619	235	Hr. 4161	267	Hr. 5310
205	Hr. 4291	236	VS. 3154	268	
206	VS. 3332 (B)	237	VS. 49	269	L. 5
207	DK. 108	238	VS. 2328	270	DK. 168
208	VS. 1059	240	DK. 2189	271	D. 552
209	Hr. 3336	241	C. 2892	272	C. 1956
210	Hr. 5597	242	Hr. 5167	273	VS. 3595
211	Hr. 4264	243	Hr. 3841	274	Hr. 5789
212	Hr. 4965	244	Hr. 9672	275	D. 289
213	Hr. 1951	245	Hr. 140	276	VS. 2542
214	D. 208	246	C. 181	277	B. 608

TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
278	Hr. 241	309	DK. 3069	340	Hr. 582
279	E. 1585	310	Hr. 1694	341	DK. 1522
280	Hr. 167	311	Hr. 4945	342	B. 428
281	Hr. 4368	312	VS. 880	343	
282	E. 1094	313	E. 1912	344	VS. 1469
283	E. 653	314	E. 250	345	Hr. 4622
284	Hr. 4110	315	Hr. 4435	346	E. 2094
285	2147	316	Hr. 5030	347	Hr. 5699
286	B. 383	317	VS. 1	348	Hr. 4994
287	Hr. 4957 (?)	318	DK. 388	349	DK. 2485
288	E. 187	319	Hr. 683	350	C. 435
289	Hr. 3506	320	VS. 2372	351	VS. 5389
290	C. 3055	321	Hr. 439 (?)	352	DM. 67
291	E. 491	322	VS. 2652	353	Hr. 2973
292	Hr. 4124	323	VS. 1799	354	Hr. 4111
293	VS. 1666	324		355	VS. 2664
294	VS. 3391	325	DK. 160	356	Hr. 4986
295	O. 2024	326	VS. 5094	357	Hr. 398
296	VS. 5494	327	C. 2073	358	VS. 778
297	VS. 505	328	Hr. 3791	359	E. 2006
298	O. 2327	329	B. 426	360	Hr. 640
299	Hr. 2723	330	Sd. 2245	361	Hr. 4869
300	Hr. 272 (?)	331	VS. 823	362	Hr. 2406
301	DK. 1528	332	Hr. 743	363	VS. 3414
302	Hr. 4584	333	D. 21	364	VS. 2989
303	Hr. 5629	334	E. 2053	365	Hr. 5516
304	VS. 855	335	Hr. 5320	366	L. 476
305	Hr. 262	336		367	C. 3024
306	C. 194	337	VS. 2262	368	Hr. 5607
307	E. 1008	338		369	E. 297
308	Hr. 164	339	Hr. 3732	370	VS. 4076

TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
371	VS. 2541	402	DK. 1519	433	E. 1651
372	VS. 1438	403	Hr. 4238	434	Hr. 4244
373	VS. 47	404	C. 2114	435	E. 2484
374	E. 'spoil earth'	405	DK. 402	439	Hr. 5804
375	Hr. 4625	406	F. 46	440	L. 323
376	C. 3133	407	Hr. 5261	441	VS. 3026
377		408	VS. 1329	442	Hr. 2657
378	DM. 56	409	VS. 1037	443	DK. 2137
379	VS. 1673	410	DK. 121	444	VS. 3093
380	DK. 2130	411	Hr. 4560	445	E. 1348
381	C. 3201	412	Hr. 5596	446	DK. 681
382	Hr. 1110	413	C. 1863	447	Hr. 4348
383	Hr. 4409	414	VS. 1558	448	E. 1846
384	DK. 2294	415	E. 1187	449	B. 588
385		416	Sd. 1930	450	Hr. 3084
386	E. 388	417	VS. 3518	451	Hr. 5028
387	C. 329	418		452	C. 606
388	Hr. 629	419	Hr. 456A	453	C. 2582
389	Sd. 1850	420	VS. 349	454	L. 785
390	VS. 2040	421	VS. 1819	455	C. 675
391	Hr. 2595	422	DM. 189	456	VS. 235
392	D. 90	423	C. 1391	457	
393	Hr. 5057	424	C. 206	458	Hr. 5225
394	DK. 33	425	1893	459	Hr. 4503
395	E. 230	426	Hr. 4386	460	Hr. 583
396	VS. 3172	427	Hr. 1950	461	Hr. 1793
397	E. 470	428	DK. 91	462	Hr. 4318
398	C. 2823	429	E. 2401	463	DK. 1542
399	C. 810	430	DK. 744	464	Hr. 4364
400	C. 2023	431	Hr. 4635	465	Hr. 4387
401	C. 2394	432	Hr. 5414	466	VS. 5414

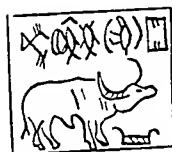
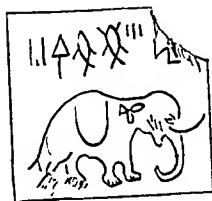
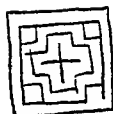
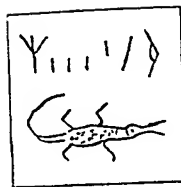
TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
467	DK. 209	498	DK. 2340	9	2642
468	VS. 1754	499	DK. 2869	10	2632
469	Hr. 4098	500	C. 427	11	2568
470	Hr. 5949	501	D. 426	12	995
471	Hr. 5787	502	O. 2372	13	2056
472	VS. 3503	503	Sd. 2172	14	1877
473	L. 904	504	B. 63	15	3758
474	O. 2767	505	VS. 1574	16	2918
475	Hr. 5193	506	C. 2896	17	2569
476	C. 290	507	Hr. 4952	18	1242
477	DK. 2797	508	D. 392	19	995
478	O. 353	509	VS. 1753	20	3091
479	Hr. 4055	510		21	1261
480	Hr. 4355	511	VS. 3027	22	726
481	Hr. 5611	512	E. 1886	23	1425
482	Hr. 5972	513	Hr. 5311	24	1280
483	Hr. 1965	514	E. 2648	25	2630
484	VS. 665	515	E. 232	26	3027
485	DK. 1543	516	DK. 3205	27	1722
486	VS. 3450	517	L. 351	28	1423
487	Hr. 1696	518		29	3851
488	Hr. 5992			30	1203
489	L. 436	H A R A P P A		31	2325
490	Hr. 5635	1	2648	32	2544
491		2	2483	33	2125
492	DK. 2651	3	3062	34	3678
493	Hr. 5971	4	3266	35	2730
494	Hr. 373	5	3035	36	3668
495	O. 2853	6	2868	37	3286
496	D. 417	7	1419	38	2728
497	L. 384	8	3171	39	1154

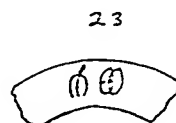
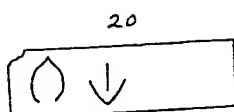
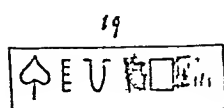
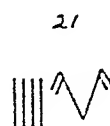
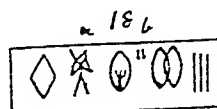
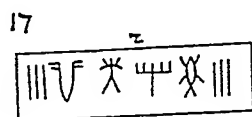
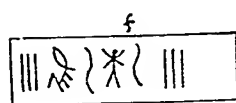
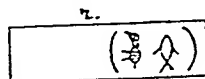
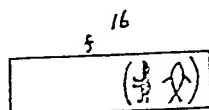
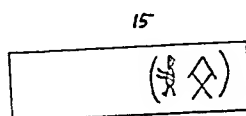
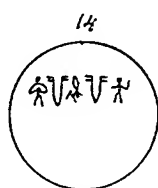
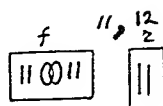
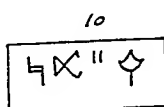
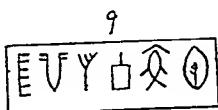
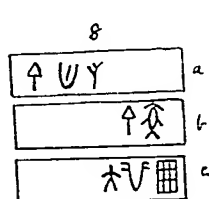
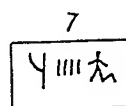
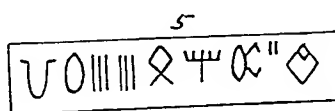
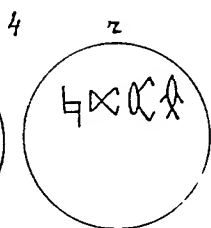
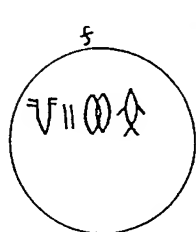
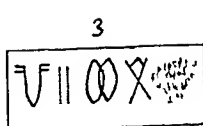
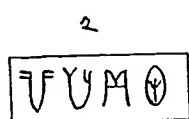
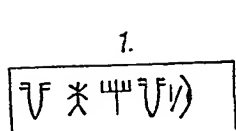
TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.	TEXT No.	MUSEUM No.
40	80	71	1279	102	3553
41	2993	72	1277	103	2890
42	2410	73	2256	104	2866
43	3173	74		105	2867
44	3178	75		106	3890
45	94	76		107	2262
46	1876	77		108	2057
47	2177	78	1665	109	2982
48	1497	79	2999	110	649
49	1219	80	2528	111	2916
50	2897	81	1260	112	3581
51	1172	82	397	113	2478
52	1282	83	1347	114	2787
53	2430	84	1416	115	1792
54	1963	85	B. $\frac{3}{4}$	116	1123
55	2631	86	F. $\frac{A}{7}$	117	657
56	2807	87	647	118	2270
57	1263	88	2900	119	1201
58	3026	89	2697	120	2276
59	3172	90	385	121	1032
60	2481	91	558	122	1245
61		92	3608	123	114
62	1348	93	3801	124	2893
63	1262	94	3789	125	2187
64	3534	95	1646	126	3771
65	2917	96	1338	127	398
66	2429	97	1399	128	561 ?
67	559	98	2891	129	3707
68		99	615	130	2731
69	1278	100	1235	131	1259
70	1260 ?	101	2759	132	

A P P E N D I X II.

Explanation.

- Col.II. det = determinative, ideo = ideogram
- Col.III. The references are to the pages in "Egyptian Grammar" by A. H. Gardiner, and to the numbers of the signs on those pages.
- Col.V. The references are to vols. VI and XVII respectively of the "Mémoire, de la Mission Archéologique de Perse" and the numbers of the signs in the Proto-Elamitic sign lists in each of these volumes.
- Col.VIII. The references given in simple figures are to the numbers of the ideograms in the original Appendix II, which is not included in this edition.
- Cols.XI and XIV. The transliteration of the values is that followed by Bühler in his "Indische Palaeographie".
- Col.XII. The numbers refer to the Tables of Proto-Indian signs in this work.





Platz III

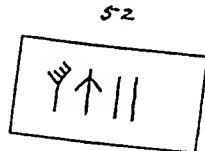
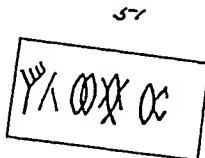
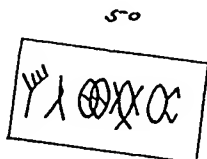
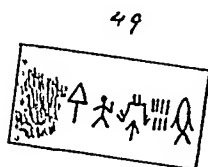
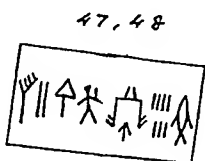
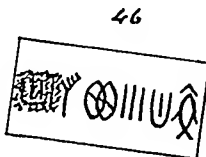
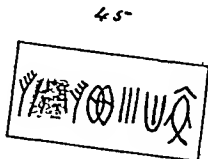
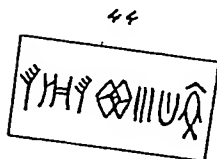
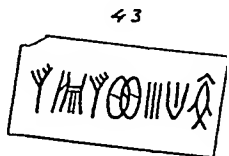
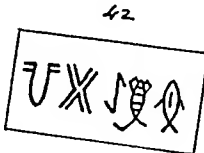
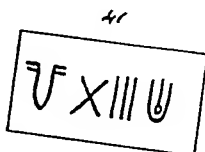
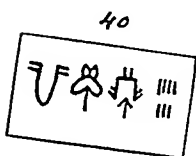
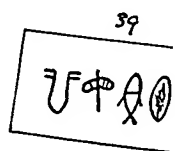
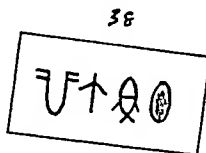
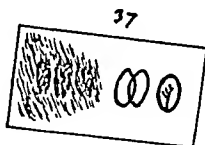
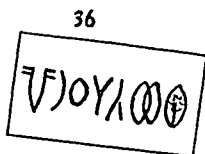
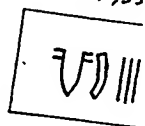
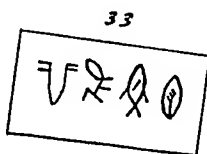
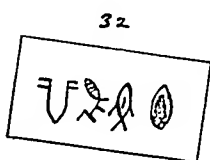
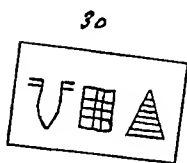
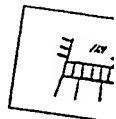
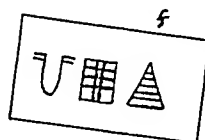
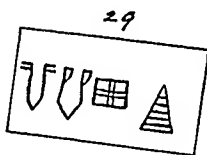
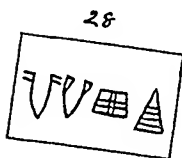
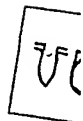
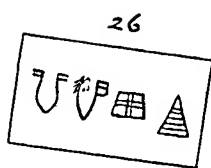
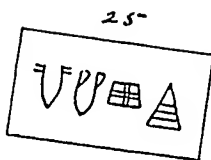
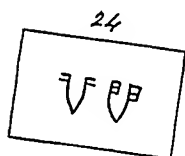
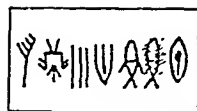


Plate IV

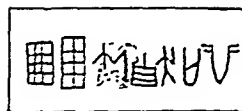
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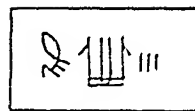
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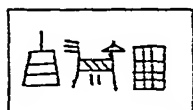
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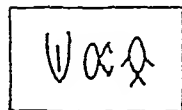
61



57



58



60



62.

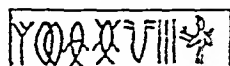
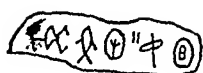
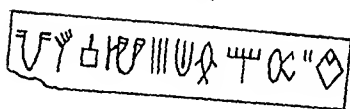


Plate V

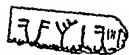
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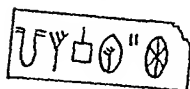
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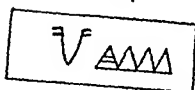
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66



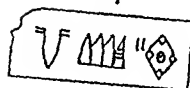
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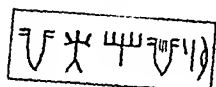
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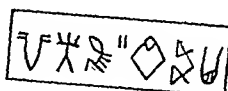
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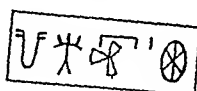
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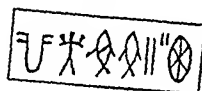
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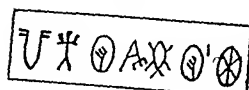
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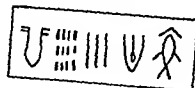
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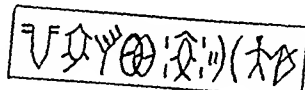
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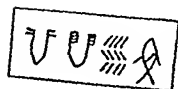
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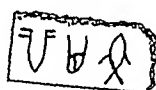
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76



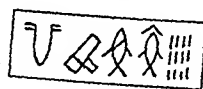
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79



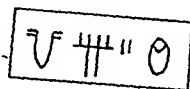
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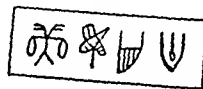
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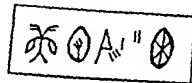
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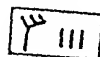
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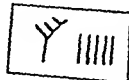
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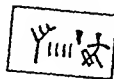
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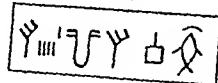
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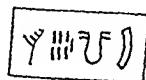
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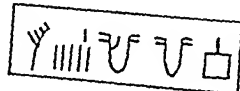
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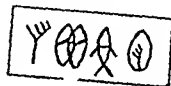
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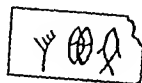
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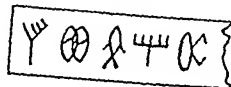
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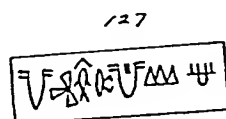
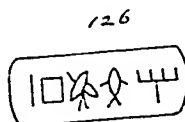
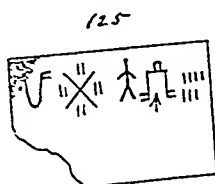
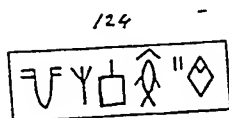
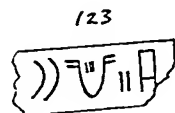
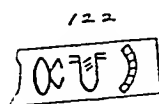
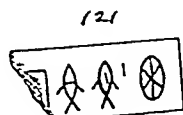
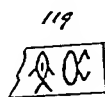
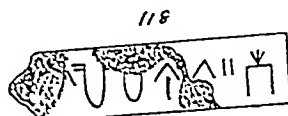
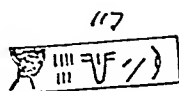
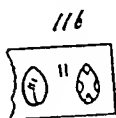
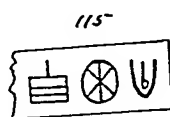
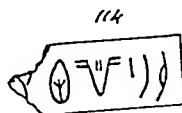
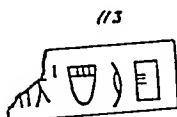
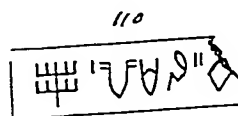
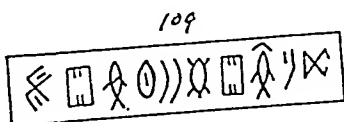
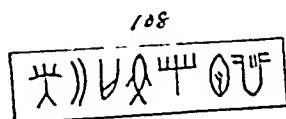
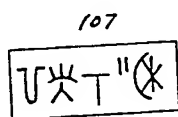
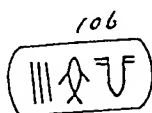
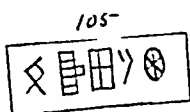
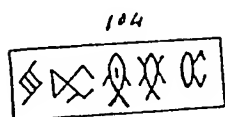
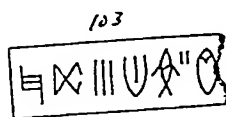
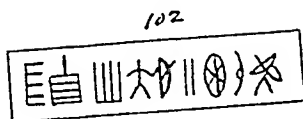
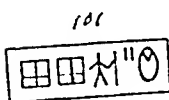
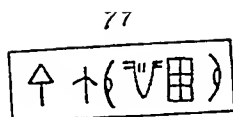
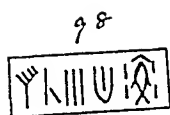
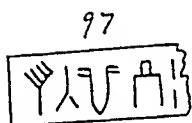
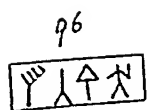


93

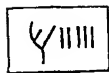


94

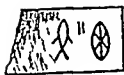




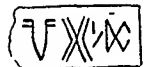
128



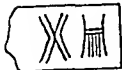
129



130

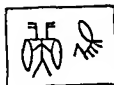


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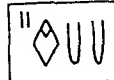


z

131

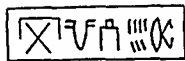


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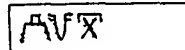


z

132



f



z

144



153



133



f

L.S.



z s.



z

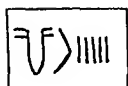
135



134



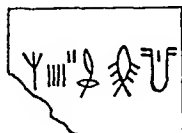
136



137



138



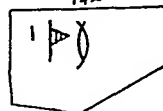
139



140



142



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143



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146



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148



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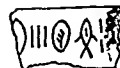
150



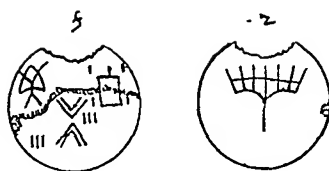
157



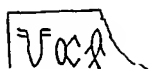
152



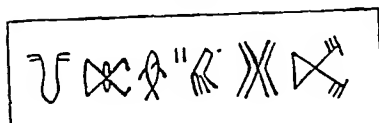
154



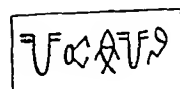
157



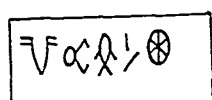
155



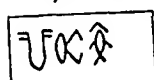
156



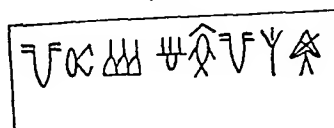
158



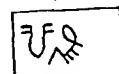
159, 160



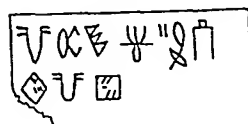
161



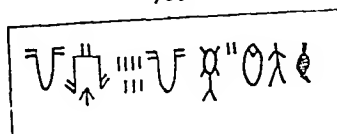
174



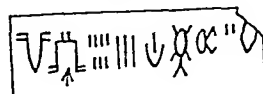
162



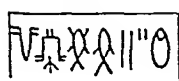
163



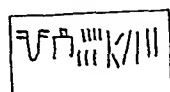
164



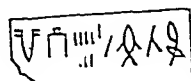
165



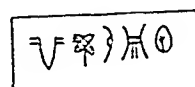
166



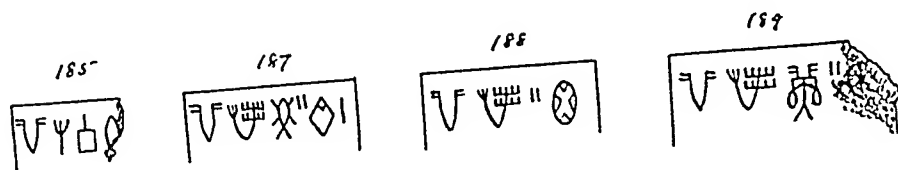
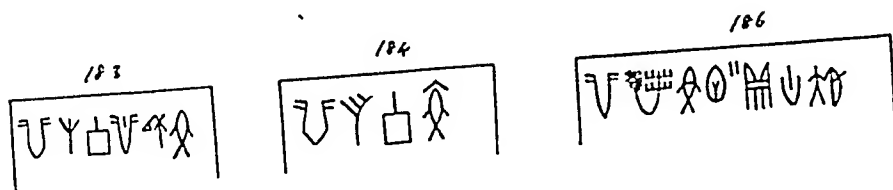
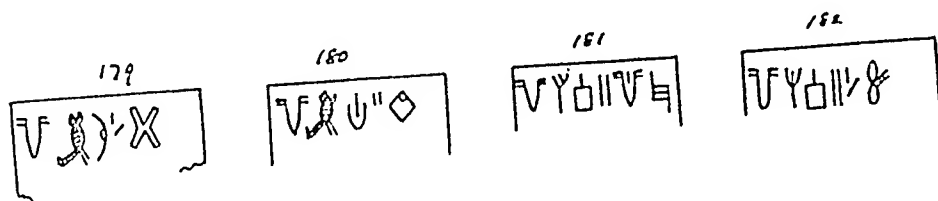
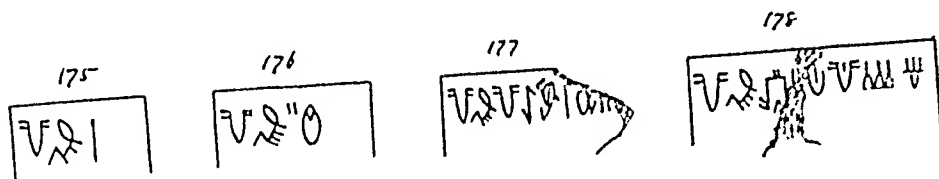
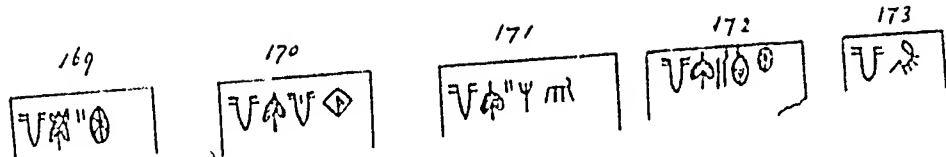
167



168



Plaque IX



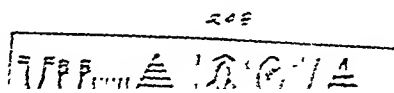
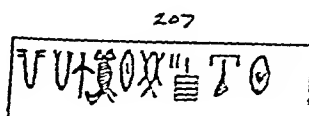
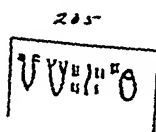
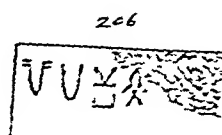
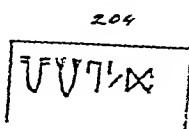
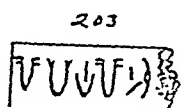
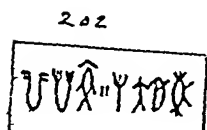
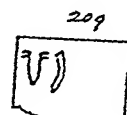
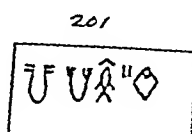
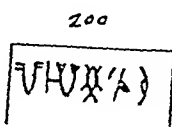
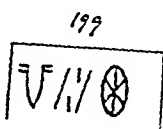
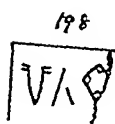
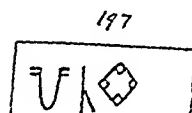
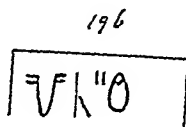
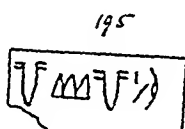
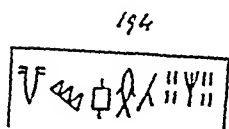
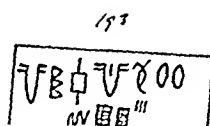
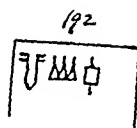
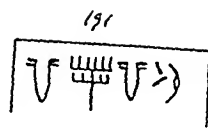
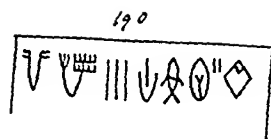


Plate XI

210
[V]A}

211
[V]A||

212
[V]A||"⊗

214
[V]»||A"⊗"T

213
[V]⊗

215
[V]»A||⊗

216
[V]»⊗

217
[V]»|

219
[V]XJ»A||"⊗

215
[V]XJ»A||A"Y⊗||

220
[V]XJ»

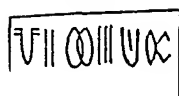
221
[V]X||V↑

223
[V]||V⊗

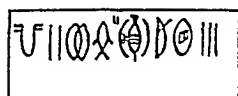
222
[V]||V⊗||"⊗

228
[V]⊗

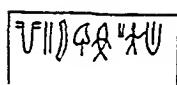
224



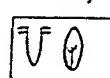
225



226



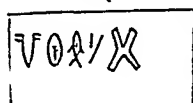
227



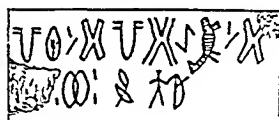
228



229



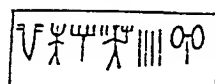
230



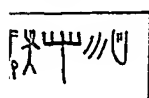
231



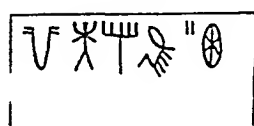
233



232



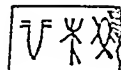
234



235



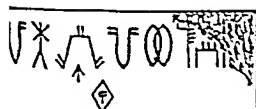
236



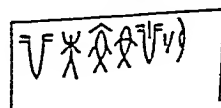
239



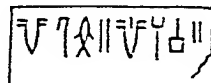
237



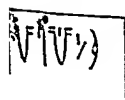
238



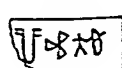
240



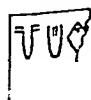
241



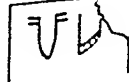
242



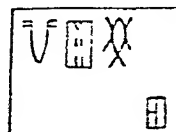
243



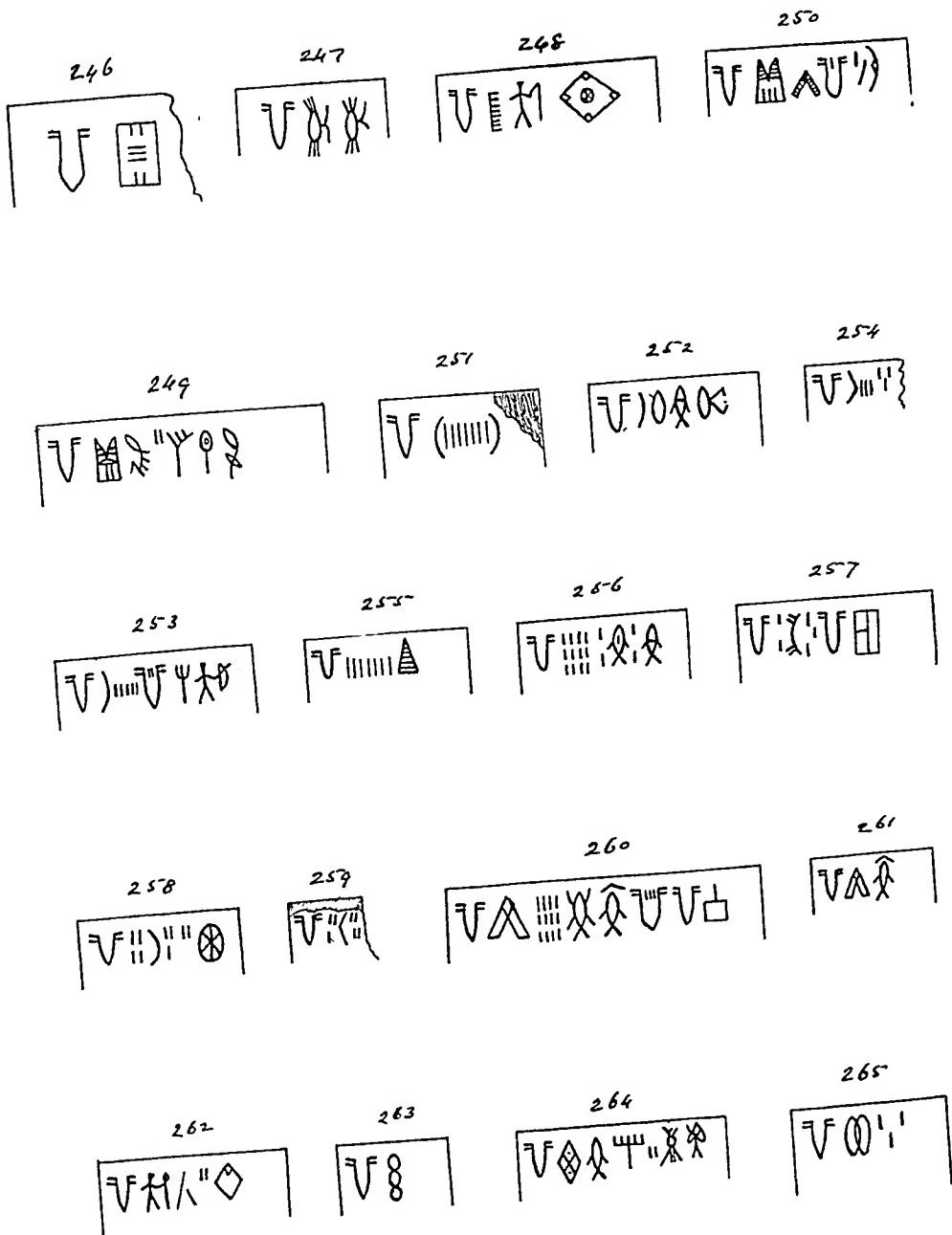
244

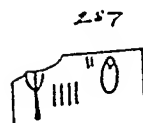
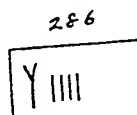
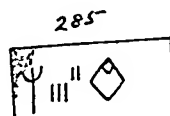
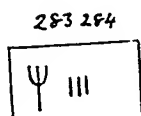
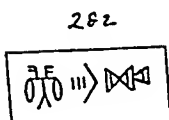
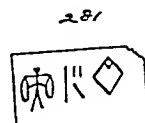
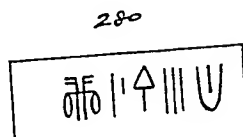
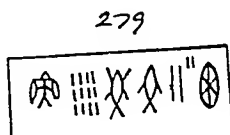
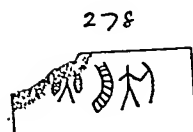
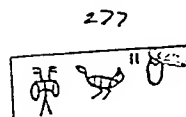
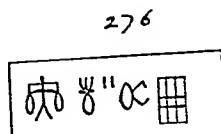
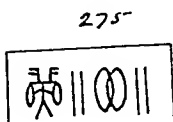
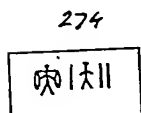
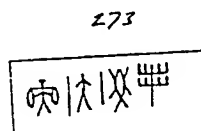
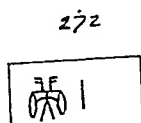
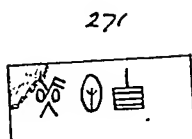
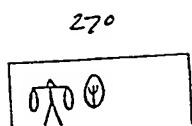
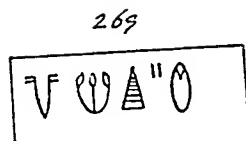
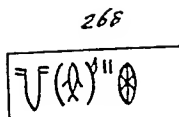
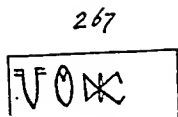
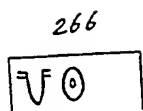


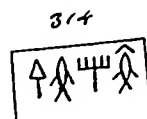
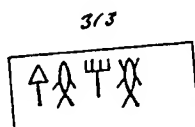
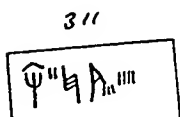
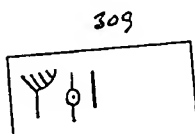
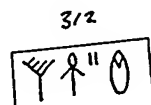
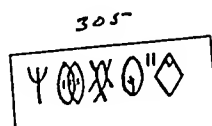
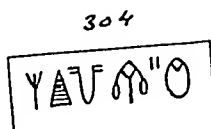
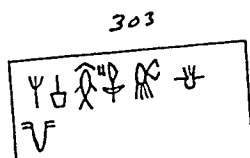
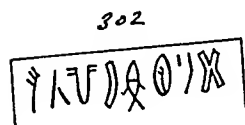
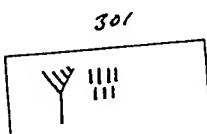
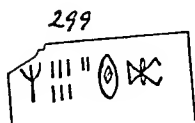
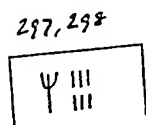
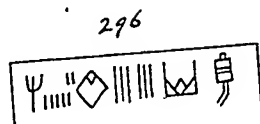
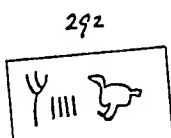
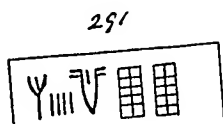
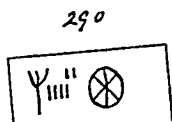
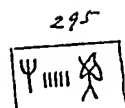
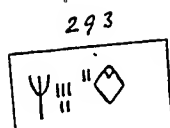
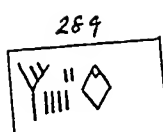
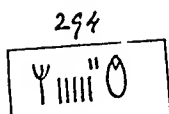
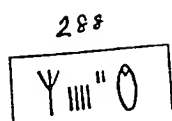
245



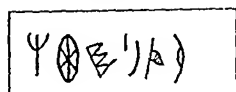
Platz XIII



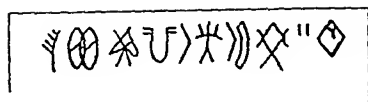




307



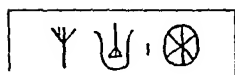
306



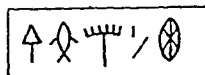
308



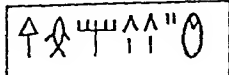
310



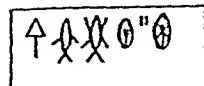
315



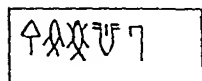
316



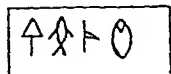
317



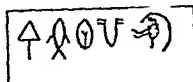
318



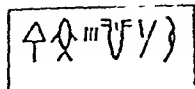
319



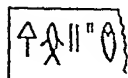
320



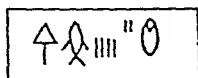
322



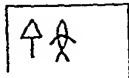
321



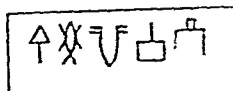
323



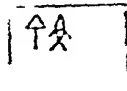
324



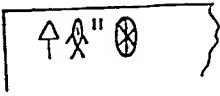
326



325



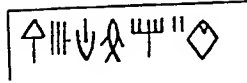
327



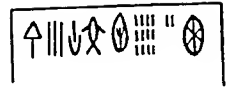
328



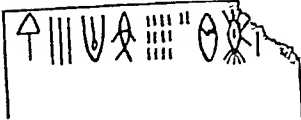
329



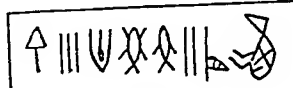
330



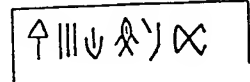
331



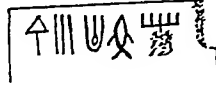
332



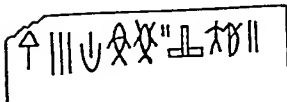
334



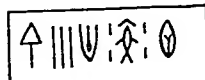
333



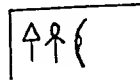
335-



336



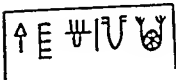
337



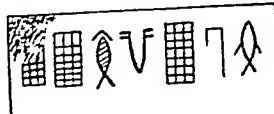
338



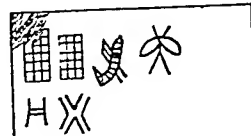
339



340



341



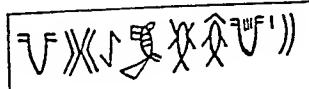
343



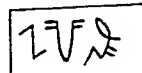
342



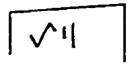
344



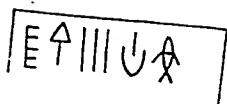
345-



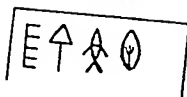
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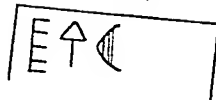
347



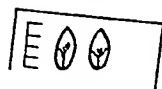
348



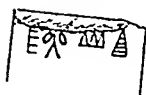
349



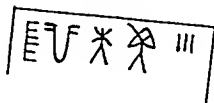
350



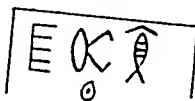
351



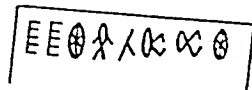
352



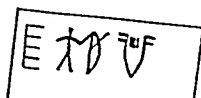
353



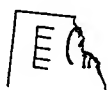
354



355



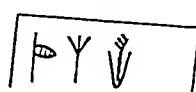
356



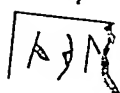
357



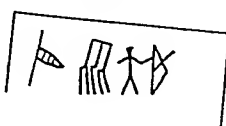
358



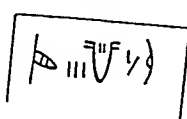
359



360



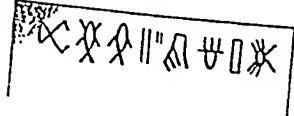
361



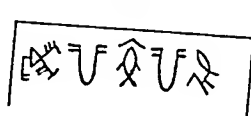
362



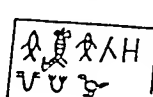
363



364



365



366

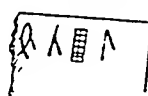
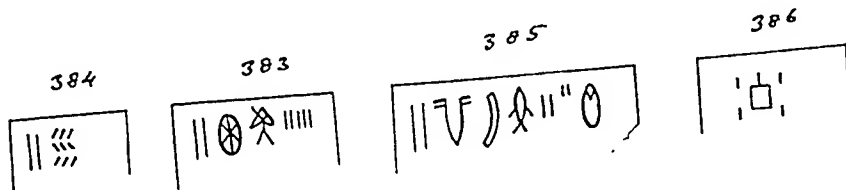
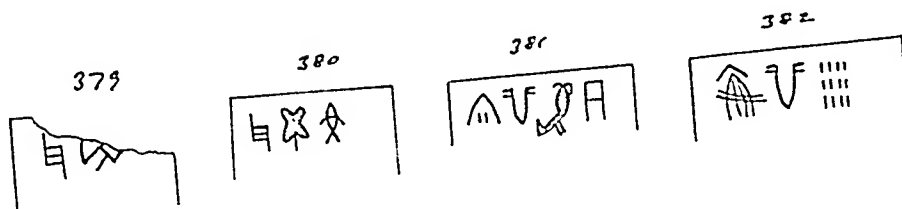
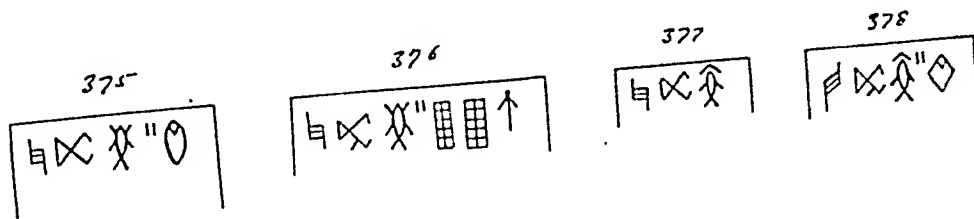
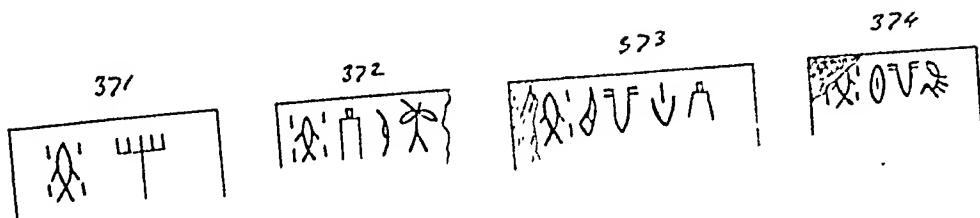
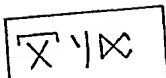


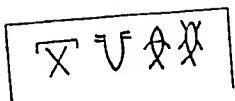
Plate XIX



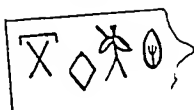
387



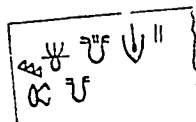
388



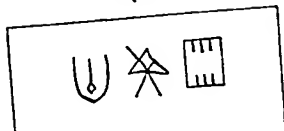
389



391



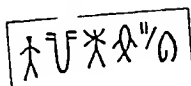
390



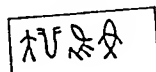
392



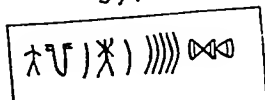
393



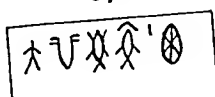
396



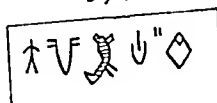
394



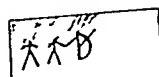
395



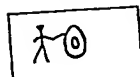
397



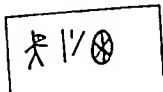
398



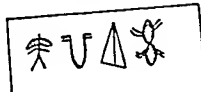
399



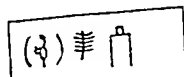
400



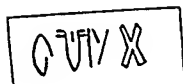
401



402



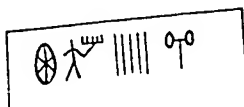
403



404

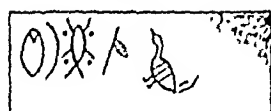


405

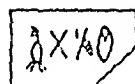


Plata XXI

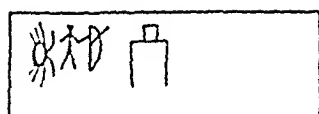
406



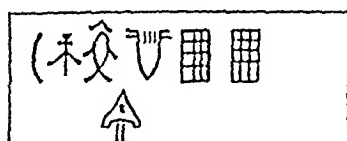
407



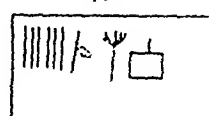
408



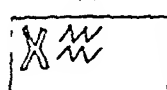
409



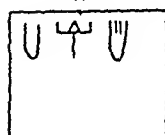
410



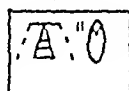
411



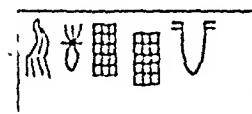
412



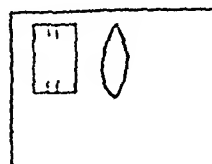
413



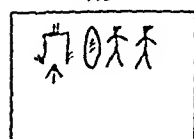
414



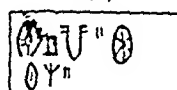
415



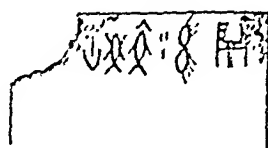
416



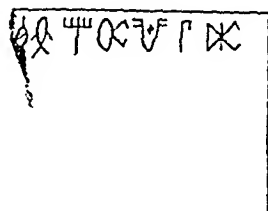
417



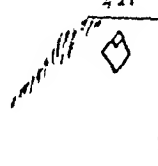
418



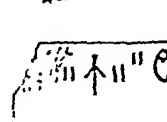
419

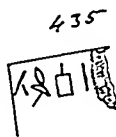
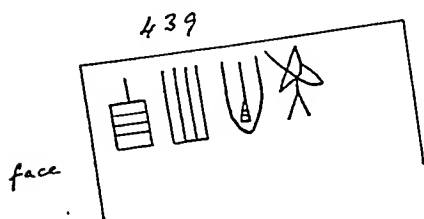
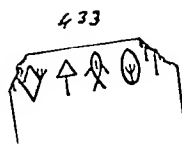
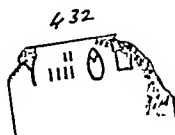
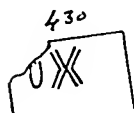
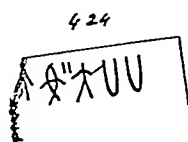
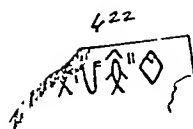
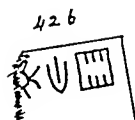


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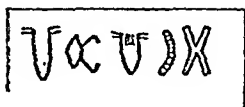


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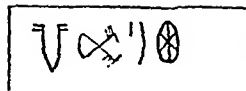




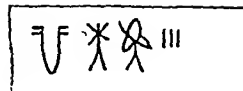
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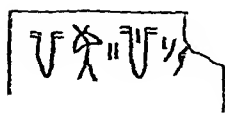
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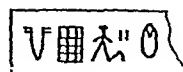
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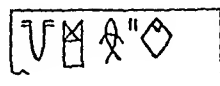
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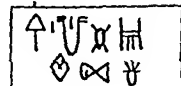
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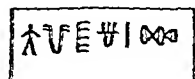
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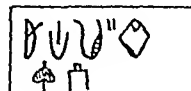
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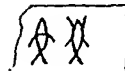
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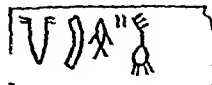
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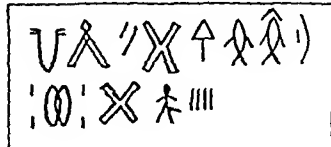
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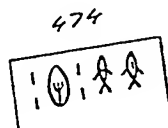
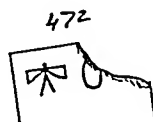
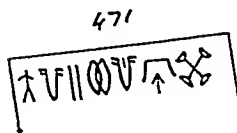
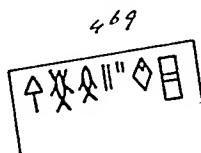
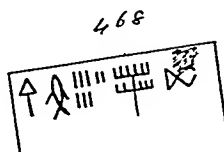
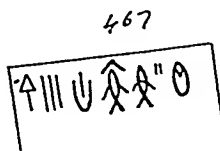
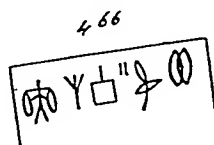
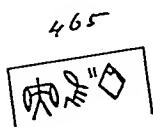
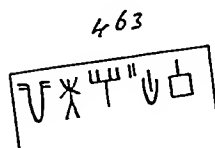
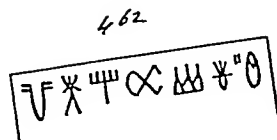
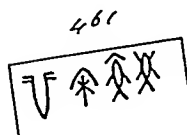
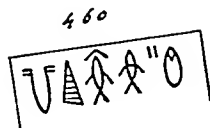
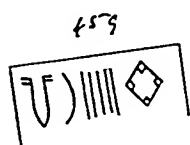
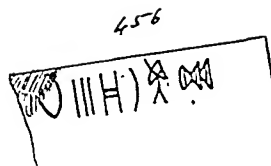
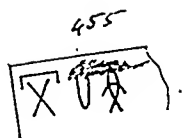
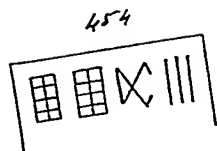


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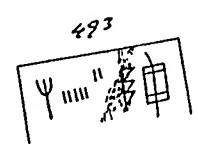
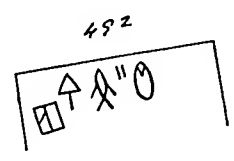
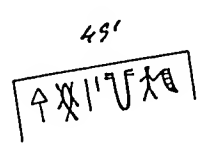
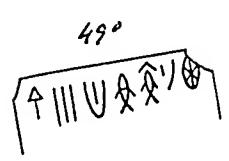
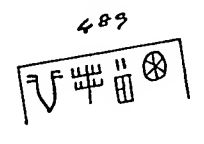
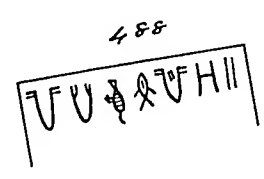
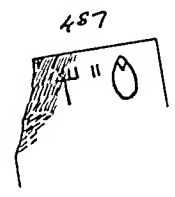
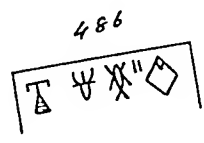
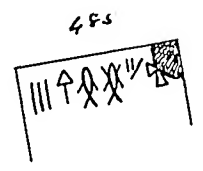
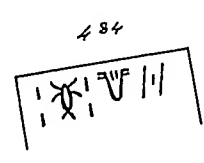
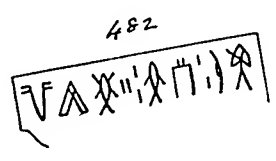
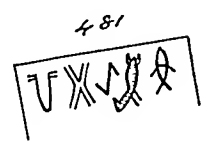
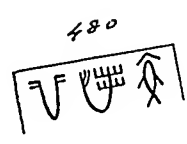
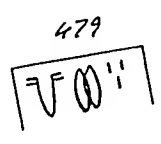
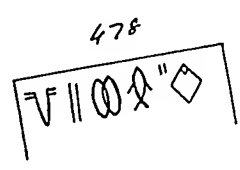
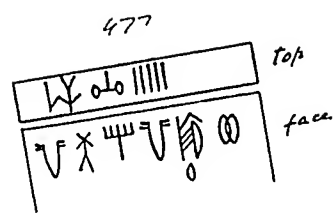
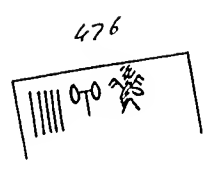
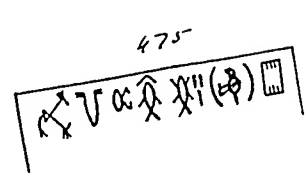


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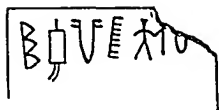




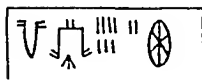
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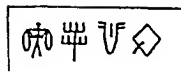
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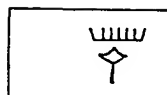
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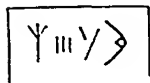
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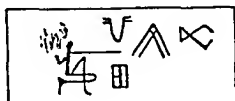
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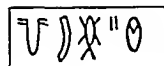
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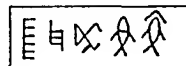
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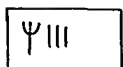
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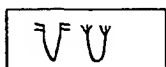
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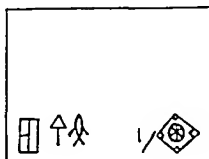
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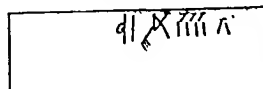
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504



525



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507



825



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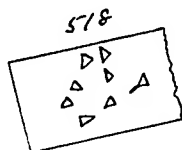
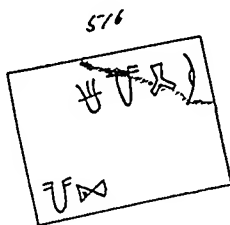
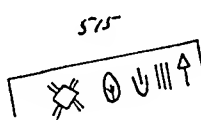
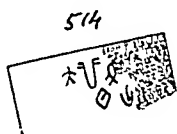
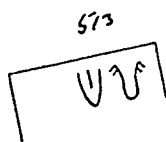
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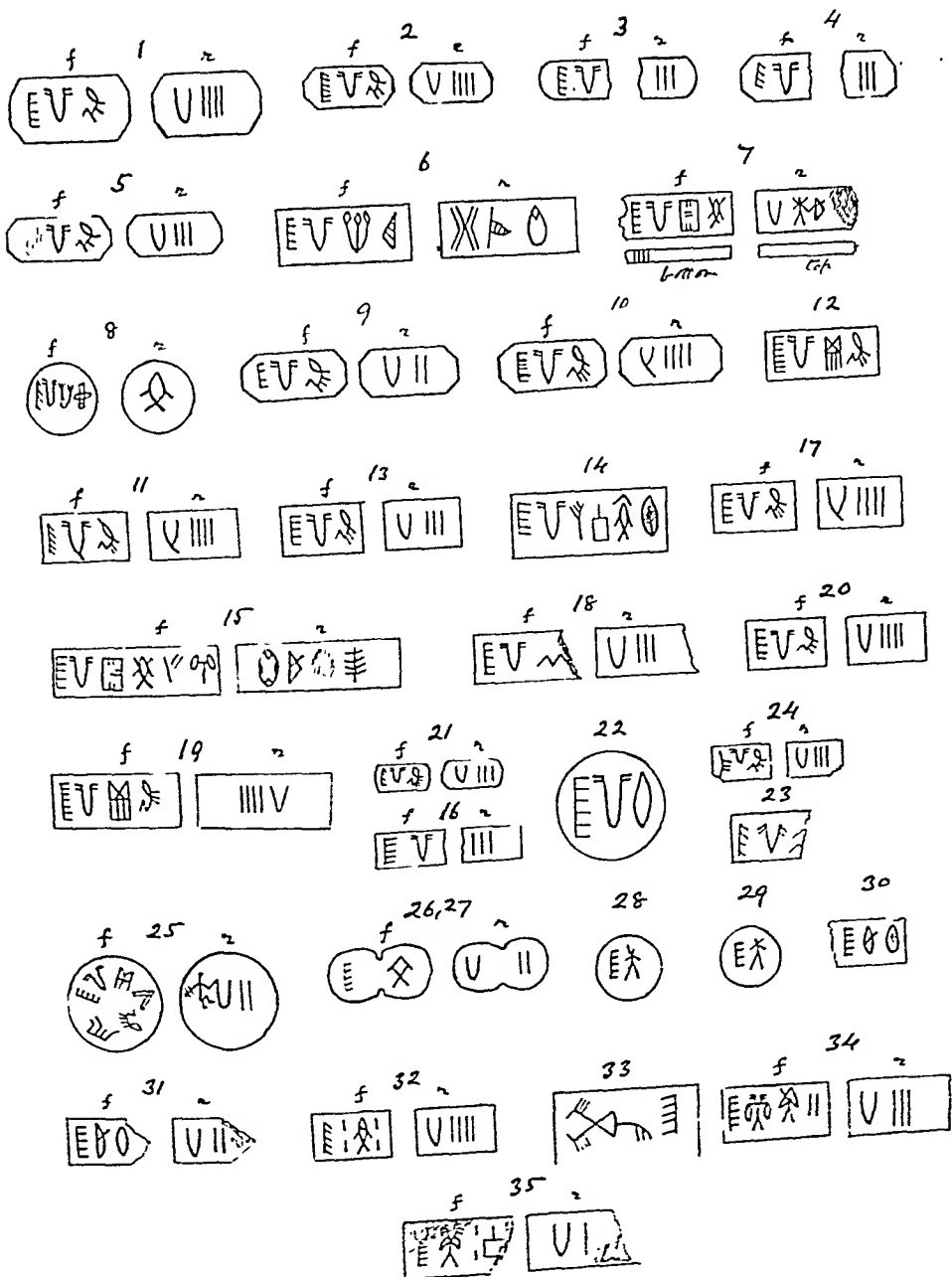


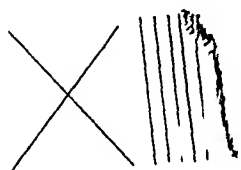
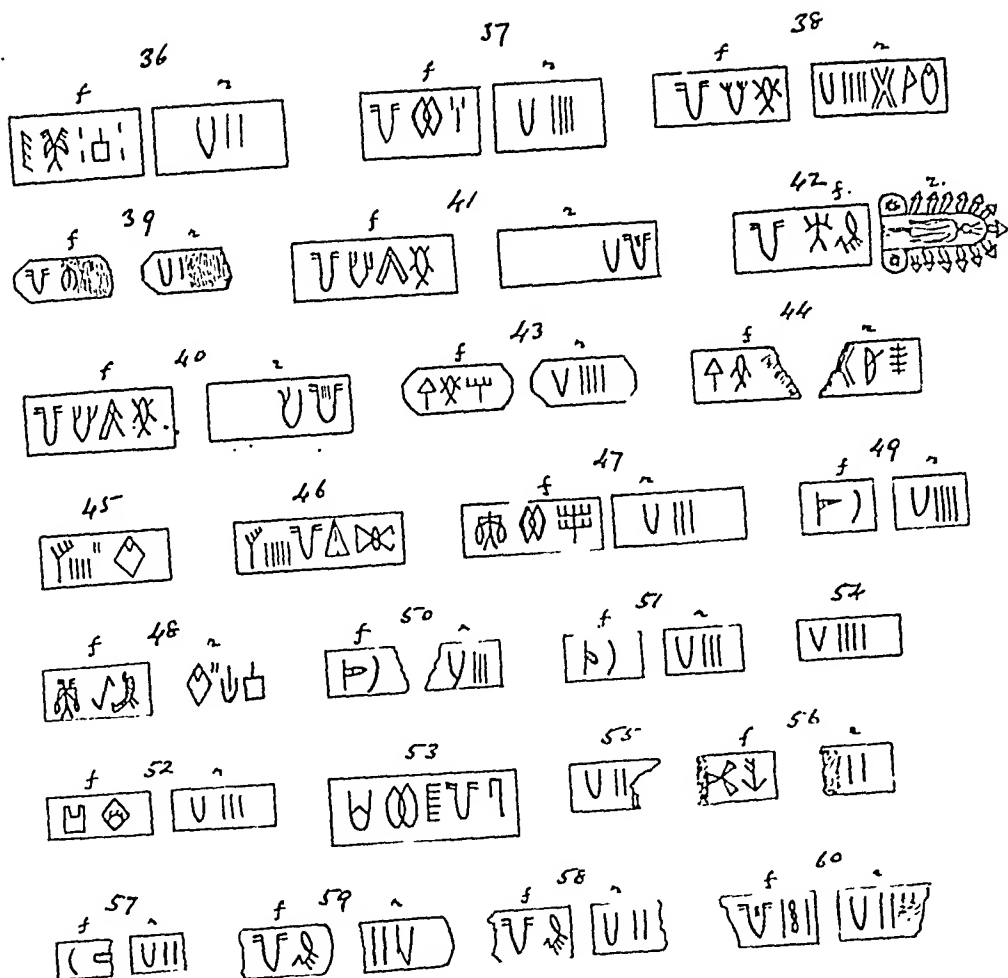
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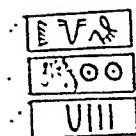
Platz ~~XXVII~~







63



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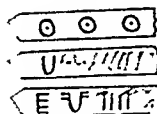
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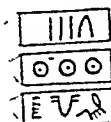
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68



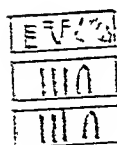
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70



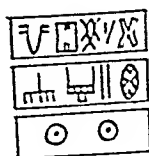
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73



74



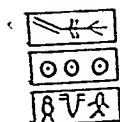
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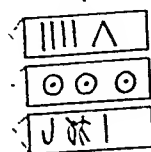
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78



79



80

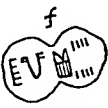
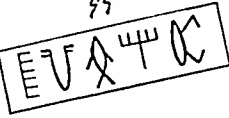
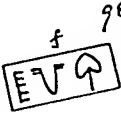
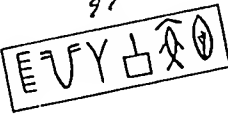
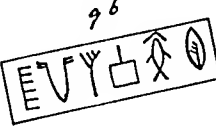
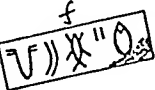
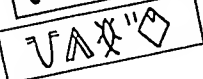
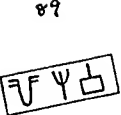
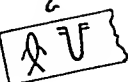
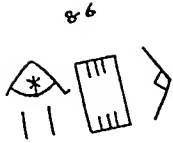
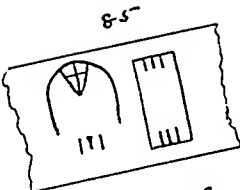
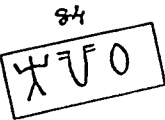


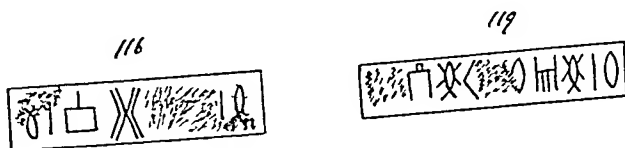
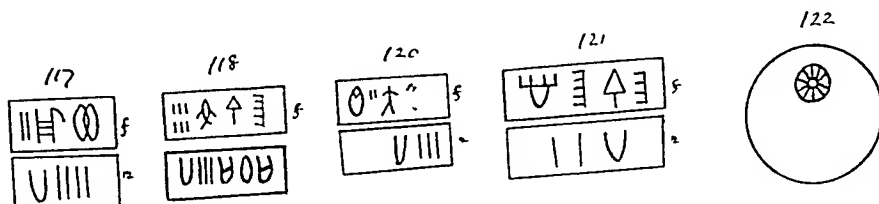
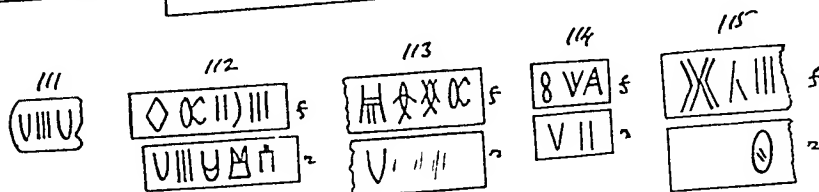
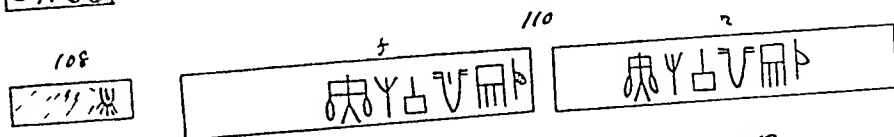
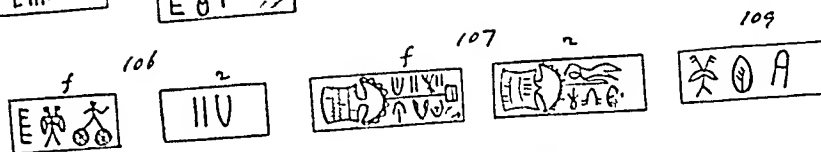
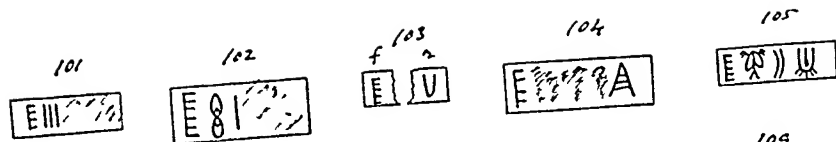
81



83







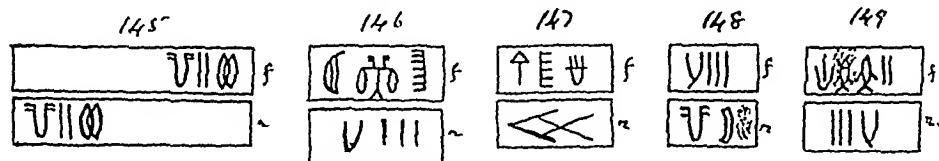
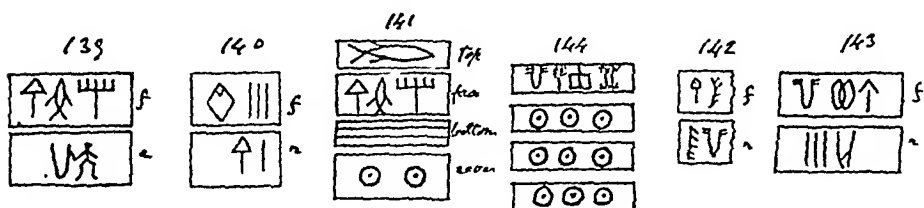
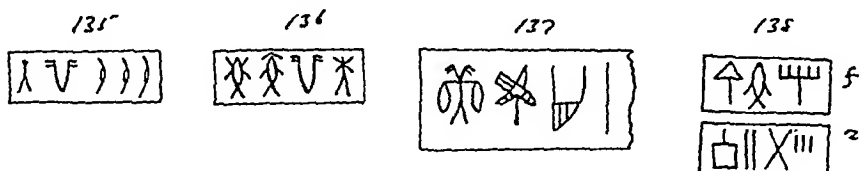
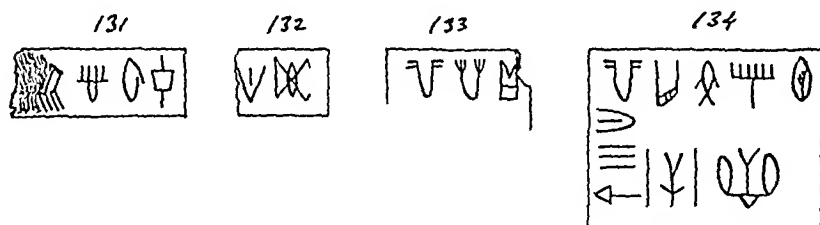
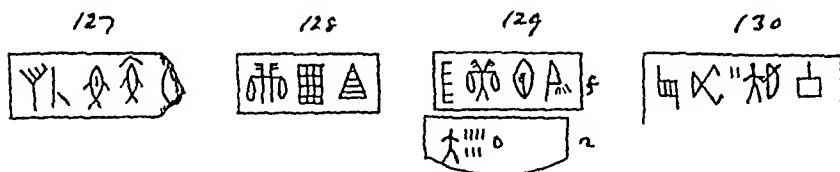
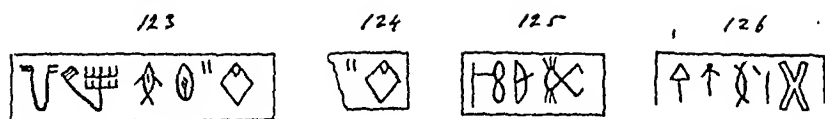


Plate XXXV

